



STORMWATER CONSTRUCTION MANUAL

CITY OF COLORADO SPRINGS
DECEMBER 2020

STORMWATER CONSTRUCTION MANUAL

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LIST OF ABBREVIATIONS

>	Greater Than
<	Less Than
CDPS	Colorado Discharge Permit System
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
City	City of Colorado Springs
C.R.S.	Colorado Revised Statutes
CSWMP	City Stormwater Management Plan
dS/m	DeciSiemens per Meter
EPA	Environmental Protection Agency
GEC	Grading and Erosion Control
Lb(s)	Pound(s)
MS4	Municipal Separate Storm Sewer System
P.E.	Professional Engineer
pH	Potential of Hydrogen
PLS/acre	Pure Live Seed Pounds Per Acre
ppm	Parts Per Million
SWMP	Stormwater Management Plan
USACE	United States Army Corps of Engineers (USACE)
USFWS	United States Fish and Wildlife Service
SWO	Stop Work Order
WQCD	Water Quality Control Division

CHAPTER 1

INTRODUCTION

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1.0 INTRODUCTION

Protecting the quality of stormwater runoff is important to the City of Colorado Springs (City), and is required by the Colorado Discharge Permit System (CDPS) Regulations. The policies and guidance described in this manual are pursuant to the Municipal Code of the City, Colorado, Chapter 7, Article 7, Part 15. The Colorado Department of Public Health and Environment (CDPHE), Water Quality Control Division (WQCD), through the Municipal Separate Storm Sewer System (MS4) permit issued to the City, requires the City to control and reduce the discharge of pollutants to protect stormwater quality and to satisfy the appropriate water quality requirements of the Colorado Water Quality Control Act (§ 25-8-101 et seq., C.R.S.) and the Colorado Discharge Permit Regulations (Colorado Regulation No. 61). The City's MS4 permit requires the City to implement a program to reduce the discharge of pollutants from public and private construction sites, and the process described herein is a part of the approved construction program.

2.0 PURPOSE OF MANUAL

This volume, entitled *Stormwater Construction Manual*, sets forth the minimum requirements and processes for obtaining a permit authorizing the discharge of stormwater from a construction site within the City. The **City Grading and Erosion Control Permit (GEC Permit)** is the permit which allows land disturbance, grading, and the discharge of stormwater from a construction site within the City. This manual explains the types of construction activities requiring such a permit, who obtains the permit, and how the permit is obtained, including project design phase requirements. This volume is not intended to and shall not be construed to give any third party any interest or rights with respect to or in connection with any provision contained herein or contemplated hereby. In addition, this manual describes the requirements and process for complying with the permit during construction, as well as the City's inspection and enforcement procedures, and the process for closeout of the permit.

Revisions to this document may be incorporated as necessary. The policies and procedures herein may be subject to change if they are found to no longer be effective or compliant with the City's MS4 requirements. **It is the responsibility of applicants to obtain the latest revision to this document.**

City staff will review project submittals for compliance with this manual and with the ultimate goal of reducing the pollution of state surface waters. The provisions in this manual shall be regarded as the minimum requirements for grading, construction erosion control, and site management. The City does not and will not assume liability for design and construction deficiencies by others.

This document contains both requirements and guidance. Requirements are denoted by verbs such as "shall" and "must," while guidance is denoted by the use of "should" or is specifically called out as guidance or recommendations.

3.0 TO WHOM DOES THE GEC PERMIT PERTAIN?

All construction projects requiring a GEC Permit according to Chapter 2, Section 1.0, must obtain the permit in accordance with the policies and procedures in this document.

4.0 RELATIONSHIP OF THIS MANUAL TO OTHER PUBLISHED CRITERIA AND REGULATIONS

In the event of a direct and irreconcilable conflict between this manual and other published City criteria, this manual shall prevail.

Compliance with this manual does not affect a Permittee's obligations to comply with other applicable state, and federal criteria and regulations.

5.0 THE RELATIONSHIP BETWEEN THE CITY AND STATE GRADING AND EROSION CONTROL PERMITTING REQUIREMENTS

5.1 The State of Colorado Stormwater Permitting

Stormwater runoff controls from construction sites are mandated by the Federal Water Pollution Control Act (Clean Water Act). In Colorado, the Environmental Protection Agency (EPA) has delegated authority for implementation of the Clean Water Act to CDPHE. CDPHE, specifically the Water Quality Control Division, issues stormwater discharge permits under the CDPS Regulations promulgated by the Water Quality Control Commission.

5.2 City GEC Permit and State CDPS General Permit

Projects with one or more acres of land disturbance associated with construction activities that are not part of a larger common plan of development or sale are required to obtain **both local and state permits** related to construction-phase stormwater discharges. The local permit in Colorado Springs is the City GEC Permit. The state permit is the CDPS General Permit for Stormwater Discharges Associated With Construction Activities (CDPS General Permit).

The City GEC Permit requirements have been structured to meet the conditions of the CDPS General Permit, in addition to local requirements. It is anticipated that a single plan could meet both state and local requirements. However, local requirements are more comprehensive than state requirements for the Stormwater Management Plan (SWMP).

In addition, the developer/contractor should note that **compliance with one permit does not remove the need to comply with the other**. The majority of construction sites will require both City and State permits. Also note that, although CDPHE does not require the state SWMP to be submitted for approval, the City does require a Grading and Erosion Control Plan (GEC Plan) with a City Stormwater Management Plan (CSWMP) to be submitted and approved prior to GEC Permit approval.

The City regulates and manages the City GEC Permit. Compliance with all local, state and federal permits and regulations, including the CDPS General Permit, is the responsibility of the owner, developer, contractor and/or engineer.

6.0 REQUEST FOR VARIANCE

Permittees may request variances from the requirements of the GEC Plan and CSWMP within the context of these rules and regulations. The procedure for requesting variances is described in the City Drainage Criteria Manual. A variance cannot be granted that would create a condition of non-compliance with the City's MS4 permit. Any variance approved by the City will be documented, including a description of the reasons for the approval and a finding that the variance does not create a condition of non-compliance with the City's MS4 Permit.

7.0 DEFINITION OF TERMS

Commonly used terms in this manual have been defined as follows for convenience, but this is not intended to be an exhaustive list.

303(d) List: Section 303(d) of the Clean Water Act requires states to list those water bodies that are not attaining water quality standards, including designated uses, and identify relative priorities among the impaired water bodies. Once a stream is listed on the state 303(d) list, a Total Maximum Daily Load (TMDL) is typically required to assign allowable pollutant loads to various sources to enable the water body to attain designated uses in the future.

404 Permit: A federal discharge permit authorized under Section 404 of the Clean Water Act, which regulates the discharge of dredged, excavated, or fill material into wetlands, streams, rivers, and other Waters of the U.S. The U.S. Army Corps of Engineers is the federal agency authorized to issue Section 404 Permits for certain activities conducted in wetlands or other U.S. waters.

Associate GEC Permit: City Associate Grading and Erosion Control Permit, which is required on individual sites within multi-lot residential or commercial projects with an overall GEC Permit where ownership has changed. This permit is legally associated with the existing GEC Permit for the larger development.

Batch Plants (Asphalt or Concrete): Portable asphalt plants and concrete plants that are located on or adjacent to a construction site, and that provide materials only to that specific construction site.

City Electronic Permitting Management System: Electronic permitting and inspection system. Information regarding access and use can be found on the City website.

City Engineer: The City Engineer or his/her designated representative.

City Stormwater Management Plan (CSWMP): A written plan required under the City's Grading and Erosion Control Permit that identifies potential measures that will be implemented to minimize erosion within construction sites and minimizes the discharge of pollutants in stormwater runoff from construction sites.

Clean Water Act: Federal legislation that provides statutory authority for the National Pollutant Discharge Elimination System program and other water quality protection requirements; Public law 92-500; § 33 U.S.C. 1251 et seq. Also known as the Federal Water Pollution Control Act. Under the Clean Water Act stormwater requirements, most urban areas must meet requirements of Municipal Separate Storm Sewer System permits.

Construction Activity: Refers to ground surface disturbing and associated activities (land disturbance), which include, but are not limited to, clearing, grading, excavation, demolition, installation of new or improved haul roads and access roads, staging areas, stockpiling of fill materials, and borrow areas. Activities that include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility are not considered construction activities. Activities to conduct repairs that are not part of regular maintenance and activities that are for replacement are considered construction activities and are not considered routine maintenance. Repaving activities where underlying or surrounding soil is cleared, graded, or excavated as part of the repaving operation are construction activities.

Construction activity occurs from initial ground breaking to final stabilization regardless of ownership of the construction activities.

Construction Control Measures: Structural and non-structural Control Measures used to limit erosion and the transport of soil and other pollutants within or leaving construction sites. Construction Control Measures can be temporary (e.g. silt fence) and permanent (e.g. seeding).

Containment: Containment is a sedimentation basin, berm, diversion, or other Control Measure which separates uncontaminated stormwater from the subject material.

Contamination: Addition of pollutants to soil, surface water, or groundwater that results in the impairment of water quality or exceedance of water quality standards for any Waters of the State, or a reasonable potential for any such impairment or exceedance.

Control Measures: Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of State waters. Control Measures also include treatment, operating procedures, and practices to control site runoff, spillage or leaks, waste disposal, or drainage from material storage. Additionally, Control Measures include structural and nonstructural controls and may be temporary or permanent.

Erosion: The wearing away of the land surface by water, wind, ice or other geological agents, including the detachment and movement of soil or rock fragments by water, wind, ice, gravity, or any combination thereof.

Final Stabilization: The condition reached when all ground surface disturbing activities at the site have been completed, and for all areas of ground surface disturbing activities where a uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed. Also includes installation of permanent roads, structural Permanent Control Measures, and removal of all temporary Construction Control Measures.

GEC Administrator: The party that has operational control over day-to-day activities at a project site which are necessary to ensure compliance with the GEC or Associate GEC Permit. **This party is authorized to direct individuals at a site to carry out activities required by the permit.**

GEC Permit: City Grading and Erosion Control Permit, which is required prior to discharging stormwater from a construction site within the City.

GEC Permit Fee: City Grading and Erosion Control Permit Fee, which must be paid prior to GEC Permit issuance.

GEC Plan: A written Grading and Erosion Control Plan required under the City GEC Permit identifying measures that will be implemented to minimize the discharge of pollutants in stormwater.

Illicit Discharge: Any discharge to a MS4 that is not composed entirely of stormwater except for sources excluded in City Code and the City MS4 Permit.

Initial Control Measures: Construction Control Measures including perimeter control, inlet protection, vehicle tracking pads with the exception of Associate GEC Permits, etc. that must be installed prior to initiating earth disturbing activities within a construction site.

Land Disturbance/Land Disturbing Activity: A man-made alteration or disturbance of the ambient land surface, natural cover or topography of land, including but not limited to clearing, grading, excavation, demolition, installation of new or improved haul roads and access roads, staging areas, stockpiling of fill materials, and borrow areas.

Larger Common Plan of Development or Sale: A contiguous area (site) where multiple separate and distinct construction activities may be taking place at different times on different schedules, but remain related. For the

purposes of this manual, contiguous means construction activities located in close proximity to each other (within ¼ mile). Construction activities are considered to be related if they share the same development plan, builder or contractor, equipment, storage areas, etc. Common plan of development or sale includes construction activities that are associated with the construction of field wide oil and gas permits for facilities that are related.

Maintenance Logs: Permittee documentation showing corrective actions, repairs or replacements of Construction Control Measures required as a result of any inspection. These documents are required to be kept either physically or electronically on site and are a part of the living document. These documents should reflect date of completion and initials of the GEC Administrator acknowledging that the items have been completed, and copies must be submitted to the GEC Inspector.

Municipal Separate Storm Sewer System: A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) owned or operated by a State, city, town, county, district, association, or other public body and designed or used for collecting or conveying stormwater.

Notice of Violation: Formally notifies a Permittee of a violation on a construction site.

Owner: The party with ownership of on the property which the construction activity is occurring.

Perimeter Controls: Construction Control Measures employed at or near the construction or disturbance limits.

Permanent Control Measures: Control Measures designed to permanently mitigate water quality impacts due to development and redevelopment projects. Examples of Permanent Control Measures include extended detention basins and sand filters.

Permittee: The entity that is issued a permit from the City. On all private projects, the Permittee must own or have legal responsibility for the property being permitted. The Permittee is ultimately responsible for ensuring compliance with the conditions of the permit.

Pollutants: Dredged soil, soil, slurry, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological nutrient, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand, or any industrial, municipal, agricultural, or construction waste.

Sediment: Particulate solid material, either inorganic or organic, that will settle or be deposited in a liquid under the force of gravity.

Site: The land or water area where any facility or activity subject to a GEC Permit for Construction Activities is physically located or conducted, including adjacent land used in connection with the facility or activity.

Source Control Measures: Practices that control pollutants where they originate and reduce pollutants from becoming entrained in stormwater.

Stop Work Order: Order from GEC Inspector to cease all construction activities. Stop Work Orders require immediate stop of all construction activities, and remediation of all violations, before construction activities can resume.

Stormwater: Surface runoff caused by precipitation (i.e. rain, snow melt, etc.).

Stormwater Management Plan (SWMP): A written plan to identify possible pollutant sources that may contribute pollutants to stormwater, and identify Construction Control Measures that, when implemented, will reduce or eliminate any possible water quality impacts. The SWMP must be completed and implemented at the time the project breaks ground, and revised as construction proceeds, to accurately reflect the conditions and practices at the site. A SWMP is a requirement of the State permit from CDPHE.

Structural Controls: Includes facilities and structures which detain or retain stormwater or provide for infiltration or evaporation of stormwater, for the purpose of or with the result of water quality enhancement.

SWENT Manager: The Stormwater Enterprise Manager or his/her designated representative.

Waters of the State (State Waters): Any and all surface waters and subsurface waters which are contained in or flow in or through this state, but does not include waters in sewage systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all water withdrawn for use until use and treatment have been completed. This definition can include water courses that are usually dry. For the purposes of the City MS4 permit, State Waters does not include subsurface waters.

CHAPTER 2

GRADING AND EROSION CONTROL PERMITTING BASICS

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1.0 ACTIVITIES THAT REQUIRE A GRADING AND EROSION CONTROL PERMIT

Any private or public construction site with **construction activities disturbing one or more acres, or construction activities that are part of a larger common plan of development or sale that disturb one or more acres** is required to obtain a City GEC Permit. Construction activities are defined in the definitions section in Chapter 1.

Construction activities involving the following will also trigger the requirement for a GEC Permit:

- Any grading or construction within an open drainage channel as determined by the review engineer.
- Any time a Permanent Control Measure is constructed or substantially modified, to be defined as involving non-maintenance related activities. Adjustments or modifications to the control structure plate will not trigger the requirement for a GEC Permit.
- On any site as deemed necessary and required by the SWENT Manager.

Sites meeting the above criteria must control erosion and prevent the transport of sediment onto adjacent properties, public rights-of-ways, streets, storm drainage facilities, channels or any other public or private facilities.

1.1 Activities for Which a GEC Permit is Unlikely to be Required

Consistent with the definition of construction activities, the following activities are unlikely to require a GEC Permit:

- Pavement repair on public or private roadways such as pothole repair and pavement patching (Construction Control Measure installation and Right-of-Way permit may be required)
- Asphalt pavement rotomilling that is only for street maintenance purposes and has no other construction activities associated with it (Construction Control Measure installation is still required)
- Geotechnical boring investigations, utility locating, and potholing resulting in land disturbance of less than one acre
- Mowing and weed control
- Minor individual home landscaping, gardening, maintenance, repair, and renovation work
- Controlled burning

- Fencing and maintenance of existing fencing
- Routine sediment removal activities associated with Permanent Control Measures
- Emergency firefighting activities

2.0 TYPES OF GRADING AND EROSION CONTROL PERMITS

2.1 Grading and Erosion Control Permit

All sites meeting the conditions described in Chapter 2, Section 1.0 are required to obtain a GEC Permit.

2.2 Associate GEC Permit

When there is a change in ownership for a parcel covered by an active GEC Permit (e.g. single family residential lot(s) or individual commercial lot(s) within a larger development), the new owner must accept responsibility for compliance with the original GEC Permit for their parcel(s). This is accomplished by obtaining an approved Associate GEC Permit. Associate GEC Permit applications must be submitted to the Stormwater Enterprise for approval prior to initiation of construction activities on such parcels.

Responsibility for part of a GEC Permit covered area must be transferred to the new owner of that part according to the process outlined in Section 4.0

3.0 OBTAINING A GEC PERMIT

3.1 How to Obtain a City GEC Permit

A GEC Plan and a CSWMP are required to be submitted and approved through the City's development review process for all projects meeting the requirements of Chapter 2, Section 1.0 before a GEC Permit application can be submitted and a permit issued. Financial assurances related to Construction Control Measures will be collected prior to GEC Plan approval. Financial assurances are not required for residential Associate GEC Permits. Financial assurances are not collected for projects completed by, or on behalf of, a municipal entity. See the City of Colorado Springs Engineering Criteria Manual for more information. A GEC or Associate GEC Permit must be obtained prior to any land disturbing activities.

3.1.1 Overview

Once the plan review process is completed (GEC Plan and CSWMP are approved) and the applicant is ready to start construction, the applicant must apply for a City GEC Permit by completing and submitting the GEC Permit application and paying the associated fee. Once the permit application has been reviewed and is

“conditionally approved” by the City, a pre-construction meeting and an initial site inspection will be scheduled with the GEC Inspector. In preparation for the initial site inspection, the permittee must install Initial Control Measures on-site, **but no grading, clearing, or excavation is permitted at this time**, except for work directly related to the installation of the Initial Control Measures as shown on the approved GEC Plan.

At the initial site inspection, a GEC Inspector will assess the Initial Control Measures for proper installation and consistency with the approved GEC Plan. Once the GEC Inspector finds the Initial Control Measure installation to be acceptable, the GEC Inspector will approve the applicant’s GEC Permit application. Once the GEC Permit application is approved by the GEC Inspector, the permit is effective and construction activities can begin. Except for the transfer of GEC Permit responsibilities to an Associate GEC Permit as set forth in this Chapter 2, Section 4.0, a GEC Permit may not be assigned without the prior, expressed, written consent of the SWENT Manager.

3.1.2 Specific Process

The process to obtain a GEC Permit is set forth below:

1. Prepare a GEC Plan (must be stamped by a licensed Colorado P.E.) and CSWMP in accordance with the requirements found in Appendix A and Appendix B, and submit the documents to the City for review. The checklists found in Appendix A and Appendix B contain the minimum requirements for the GEC Plan and CSWMP.
2. The GEC Plan and CSWMP must conform to existing approved drainage reports as needed and as determined by the review engineer. Additional drainage-related submittals may be required. Refer to the Drainage Criteria Manual for more information.
3. The City will review the GEC Plan and CSWMP in accordance with checklists found in Appendix A and Appendix B, respectively. All GEC Plans and CSWMPs not meeting the requirements of the review checklists will be rejected and returned to the applicant. The applicant must revise the plans as necessary according to City review comments to obtain City approval. Subsequent review by the City may be required as necessary. Once all City review comments have been addressed, obtain the necessary signatures in accordance with the pertinent signature blocks (Appendix D). Financial assurances, if required, must be submitted prior to GEC Plan approval. The GEC Plan and CSWMP approval is valid for a period of one calendar year from the date of approval, or as long as a GEC or Associate GEC Permit is active for the site.
4. Once the GEC Plan and CSWMP have been approved, the applicant must complete and submit a GEC Permit application and pay the GEC Permit fee.
5. Once the City has reviewed the permit application and it is “conditionally approved,” schedule a pre-construction meeting and notify the GEC Inspector.

6. After the pre-construction meeting, schedule an initial site inspection by contacting the GEC Inspector.
7. Install the Initial Control Measures on-site, per the approved GEC Plan and CSWMP. No other construction activities will be permitted prior to the installation of the Initial Control Measures.
8. Obtain GEC Inspector's formal approval of the GEC Permit.
 - a. During the initial site inspection, the GEC Inspector will verify the installation of appropriate Initial Control Measures for the project and execute the GEC Permit, authorizing the permittee to begin construction activities. The GEC Inspector will also take photographs of the existing vegetation at this time.
 - b. If the site fails the initial site inspection, the GEC Permit will not be executed and Initial Control Measure installation must be corrected and re-inspected by the GEC Inspector prior to GEC Permit approval and prior to engaging in any construction activities.
 - c. The GEC Inspector's approval following a passing initial site inspection initiates the GEC Permit coverage and authorizes construction activities to commence.
9. During the construction phase, recurring inspections are conducted by both the Permittee or GEC Administrator and the City's inspection staff to ensure that the site continues to comply with the GEC Permit. More information on construction phase requirements is provided in Chapter 4.
10. If construction does not commence within 12 months of GEC Permit issuance (date approved by GEC Inspector after initial inspection), or if the construction site is idle for 12 consecutive months, a new GEC Permit must be obtained prior to commencing or re-commencing construction activities.

3.2 GEC Permit Fee

A GEC Permit application will only be reviewed after the permit fee has been collected. The GEC Permit Fee is assessed according to the Stormwater Enterprise GEC Permit Fee Schedule, found on the City website.

The GEC Permit Fee may be modified according to the enforcement policies found in Chapter 6.

4.0 TRANSFER OF RESPONSIBILITY TO AN ASSOCIATE GEC PERMIT

When a lot is sold and ownership is transferred, an Associate GEC Permit is required prior to performance of any construction activities on the lot. An Associate GEC Permit must be obtained prior to any construction activities on individual lot(s). Construction activities performed on individual lots prior to obtaining an Associate GEC Permit will be subject to the enforcement procedures described in Chapter 6. The following sets forth the process for obtaining an Associate GEC Permit.

1. The new owner and their GEC Administrator must complete, sign, and submit an Associate GEC Permit application and the Associate GEC Permit fee to the Stormwater Enterprise. The Associate GEC Permit fee is assessed for each lot added to an Associate GEC Permit according to the Stormwater Enterprise GEC Permit Fee Schedule, located on the City website.
2. Associate GEC Permits should use the typical lot details included in the overall GEC Plan if appropriate. Associate GEC Permit applications for atypical lots (not consistent with typical lot details found on the City website) must be accompanied by a detail depicting Construction Control Measures for the atypical lot. A modified typical lot detail sheet may serve this purpose at the discretion of the GEC Inspector. Atypical lot details must be reviewed and approved by the Stormwater Enterprise prior to Associate GEC Permit "conditional approval." The Associate GEC Permit will reference the CSWMP associated with the larger GEC Permit.
3. Once the City has reviewed the permit application and it is "conditionally approved," an initial site inspection will be scheduled with the GEC Inspector.
4. Install the Initial Control Measures on-site, per the approved GEC Plan (including any typical or atypical lot details) and CSWMP. No other construction activities will be permitted prior to the initial site inspection by the GEC Inspector.
5. Obtain GEC Inspector's formal approval of the Associate GEC Permit.
 - a. During the initial site inspection, the GEC Inspector will verify the installation of appropriate Initial Control Measures for the project and execute the Associate GEC Permit, authorizing the permittee to begin construction activities.
 - b. If the site fails the initial site inspection, the Associate GEC Permit will not be executed and Initial Control Measure installation must be corrected and re-inspected by the GEC Inspector prior to Associate GEC Permit approval and prior to engaging in any construction activities.
 - c. The GEC Inspector's approval following a passing initial site inspection authorizes construction activities to commence.

6. During the construction phase, routine inspections are conducted by both the Permittee or GEC Administrator and the City's inspection staff to ensure that the site continues to comply with the Associate GEC Permit. More information on construction phase requirements is provided in Chapter 4.
7. If construction does not commence within 12 months of Associate GEC Permit issuance (date approved by GEC Inspector after initial inspection), or if the construction site is idle for 12 consecutive months, a new Associate GEC Permit must be obtained prior to commencing or re-commencing construction activities.
8. The Associate GEC Permit Permittee is subject to the conditions of the existing GEC Permit in relation to any lot(s) owned, including individual lot typical detail(s), or approved modified typical detail(s), if applicable.
9. If the existing GEC Permit is closed pursuant to the requirements in Section 3.0, the Associate GEC Permit holder is responsible for any Construction Control Measures affecting or located on the Associate GEC Permit site.

5.0 GEC ADMINISTRATOR DESIGNATION AND TRAINING

5.1 Qualifications of GEC Administrators

A GEC Administrator shall be designated by the Permittee and identified in the GEC or Associate GEC Permit. The Permittee's designated GEC Administrator shall be a contact on the GEC or Associate GEC Permit application and shall be acquainted with the City's GEC requirements and processes before the start of construction.

GEC Administrators must have the experience and background necessary to:

1. Read the GEC Plan and CSWMP, project design drawings, specifications, and this manual and understand the content and the processes necessary to complete the required tasks,
2. Implement, maintain, and revise the GEC Plan throughout the duration of the project,
3. Understand Construction Control Measure selection and application,
4. Recognize Construction Control Measure maintenance needs and failures, and ensure that maintenance is conducted and Control Measure failures are repaired, as needed or required on an ongoing basis, and
5. Effectively communicate with City staff and inspectors regarding Construction Control Measures.

5.1.1 Stormwater Management and Erosion Control During Construction Class

As of July 1, 2021, all GEC Administrators must successfully complete the City-sponsored Stormwater Management and Erosion Control During Construction class (received a certification of completion) prior to being designated by a Permittee on any GEC or Associate GEC Permit applications. This class is tailored to the City criteria. An equivalent alternative certification may be accepted at the Stormwater Enterprise's discretion.

It is also highly recommended that the GEC Administrator complete the following City classes to be able to fulfill his/her duties on site:

- Construction Control Measures Field Academy – This class includes hands on Construction Control Measure installations, and is tailored to the City criteria. You work in groups at a prepared location with stations in which your group is assigned Control Measure installation for erosion and sediment control. Examples of stations include rolled products like blankets and perimeter controls like silt fence. Once the Control Measure(s) have been installed, water is applied to see how they perform.

- SWMP Training – This class covers the development and implementation of Stormwater Management Plans. This class is not specific to the City. This training program is designed to provide information about how to prepare and implement SWMPs to help comply with the requirements of the CDPS permit as issued by the Colorado Department of Public Health and Environment, Water Quality Control Division.
- Stormwater Inspector Training – This 2 day training course is for compliance inspectors of Construction Control Measures used to control erosion and sedimentation during construction. Upon completion of the program, participants will be able to:
 - Describe the permit conditions
 - Describe procedures for conducting on-site inspections for permit compliance
 - List the five elements of a finding of noncompliance
 - Describe the recordkeeping requirements for permitted sites
 - Examine appropriate applications, installations, and maintenance of Construction Control Measures
 - Generate a report to document findings

It is in the Permittee's best interest to ensure GEC Administrators are well qualified and trained. Interested parties may contact the City for additional training resources.

CHAPTER 3

DESIGN PHASE REQUIREMENTS

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1.0 OVERVIEW OF DESIGN PHASE REQUIREMENTS

An approved GEC Permit requires both a GEC Plan and a CSWMP. The GEC Plan and CSWMP may be prepared, submitted, and reviewed separately. The GEC Plan must be prepared by a Colorado licensed Professional Engineer, while the CSWMP may be prepared by either the site GEC Administrator or a Colorado licensed Professional Engineer.

2.0 PERMANENT GRADING REQUIREMENTS

All permanent grading must meet the following criteria:

- Grading must conform to all applicable safety requirements.
- Erosion control blanket or a suitable alternative must be installed on all graded slopes 3:1 and greater. Additional stabilization measures may be required at the discretion of the Stormwater Enterprise Manager.
- A global slope stability analysis performed by a Colorado licensed Professional Engineer or an alternative approved by the City Engineer must be performed for permanent slopes graded steeper than 3:1. This criteria can be waived at the discretion of the City Engineer without a variance. Refer to the Engineering Criteria Manual for additional slope stability requirements.
- All projects shall be designed to prevent and/or minimize soil erosion, both during construction and at final stabilization.
- Coordination with Colorado Springs Utilities must occur for projects changing the depth of cover over an existing utility by 18 inches or more.

3.0 PREPARATION OF A GRADING AND EROSION CONTROL PLAN

During the design phase of a proposed construction project within the City, applicants must submit a GEC Plan, which is comprised of detailed information on proposed Construction Control Measure installation at the construction site, in accordance with the City requirements described herein.

The GEC Plan must conform to existing approved drainage reports as needed and as determined by the review engineer. Additional drainage-related submittals may be required. Refer to the Drainage Criteria Manual for more information.

3.1 GEC Plan Elements

The GEC Plan shall:

- Depict site grading, permanent structures for conveying and treating storm runoff, Construction Control Measures, and final stabilization measures. Final details for the permanent conveyance and treatment of storm runoff are not required to be shown in the GEC Plan as they are required in separate documents. However, the type, location, and general configuration of permanent conveyance and treatment devices shall be shown.
- Consist of appropriate erosion control practices and sediment trapping facilities in order to accomplish adequate erosion control. City-specific Construction Control Measures details must be followed and are located in Appendix E. Additional approved Construction Control Measures are located on the City's website.
- Be prepared in accordance with good engineering, hydrologic, and pollution control practices and be updated throughout construction and stabilization of the site by the GEC Administrator.
- Address all items in the GEC Plan checklist, which can be found in Appendix A. The checklist is provided for the convenience of the preparer and is not required to be submitted with GEC Plans. No plans will be approved without successful fulfillment of the checklist.

Plans showing improvements or construction outside the property line of the site will not be approved unless the plan is accompanied by an appropriate legal easement for the impacted area or written acceptance by the adjacent property owner.

It is likely that the GEC Plan will require additions or other modifications once construction activities commence. More information about construction phase requirements can be found in Chapter 4.

3.2 Phased GEC Plans

For the purposes of this section, initial phase refers to erosion control planning prior to and immediately after overlot grading. Interim phase refers to the time after roads and utilities are installed and before vertical construction begins. Vertical construction phase refers to the period of vertical construction. For example, a large residential subdivision may have an overlot grading erosion control plan (initial), an erosion control plan depicting the roads without additional construction (interim), and an erosion control plan depicting individual lots during the building phase (vertical construction).

Financial assurances shall be collected for all phases of construction included in the GEC Plan prior to GEC Permit approval. Initial phases of GEC Plans may be approved and move forward at the SWENT Manager's

discretion. In these cases, work on the next phase of construction shall not commence without an additional approved GEC Plan containing the remaining phase(s).

3.2.1 Sites of Less than 1 Acre

Where land disturbance will be less than 1 acre, phased GEC Plans are not required.

3.2.2 Sites of Between 1 Acre and 10 Acres

For sites with land disturbance area between 1 acre and 10 acres, initial and vertical construction phased plans will be required.

3.2.3 Sites of Greater than 10 Acres

For sites with land disturbance area greater than 10 acres, initial, interim, and vertical construction phased plans will be required.

Capital projects are not subject to phasing requirements as listed above. Phasing requirements for individual capital projects are determined by the review engineer based on the project scope.

Sites with land disturbance area greater than 30 acres must address construction phasing, including temporary stabilization methods for areas which will not be disturbed for more than 14 days at a time.

3.3 Plan Preparation by a Colorado Professional Engineer

GEC Plans being submitted for approval must be prepared by or under the direction of a Colorado licensed Professional Engineer (P.E.) and include the P.E.'s license number and signature. Prints of the approved plan must bear the professional seal of the P.E. in accordance with City Code and state law.

Although GEC Plans prepared by municipal staff are exempted from the P.E. requirement above, specific signature blocks are required to be included. See Appendix D for the applicable signature blocks.

4.0 PREPARATION OF A CSWMP

In addition to a GEC Plan, applicants are required to submit a CSWMP in accordance with the City requirements described in the following sections. The CSWMP document may be combined with the CDPHE SWMP.

4.1 CSWMP Elements

The CSWMP must, at a minimum:

- Identify all potential sources of pollution which may affect the quality of stormwater discharges associated with construction activity.
- Describe project timing, inspection requirements, and project phasing.
- Include appropriate measures to control the discharge of pollutants associated with waste at the construction site such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste, and other illicit discharges including construction dewatering and wash water that may cause adverse water quality impacts to State Waters.
- Describe the practices to be used to reduce the pollutants in stormwater discharges associated with construction activity including installation, implementation and maintenance requirements.
- Discuss any additional permits related to the Clean Water Act.
- Be prepared in accordance with good engineering, hydrologic, and pollution control practices and be updated throughout construction and stabilization of the site.
- Address all items in the CSWMP checklist, which can be found in Appendix B. This checklist is provided for the convenience of the preparer and is not required to be submitted with the CSWMP.

The CSWMP may require additions or other modifications once construction commences. More information about construction phase requirements can be found in Chapter 4.

4.2 CSWMP Preparation

The CSWMP does not have to be prepared by a Colorado licensed Professional Engineer. If not prepared by a Colorado licensed Professional Engineer, the CSWMP must be prepared by the site GEC Administrator. Qualifications for the GEC Administrator can be found in Chapter 2, Section 6.0.

5.0 SUBMITTAL PROCESS

5.1 Review Process

The submittal review process for CSWMPs and GEC Plans is as follows:

- Submit electronic documents to the City. Documents must be submitted in accordance with the Stormwater Enterprise Electronic Document Policy. Plans must be printable to scale on 11-inch x 17-inch paper.
- Review comments are typically returned to the preparer within 10 business days.
- After all comments have been addressed to the satisfaction of the SWENT review engineer, submit a signed electronic copy for approval.
- The final electronic copy is returned to the Permittee and/or engineer.

6.0 CONSTRUCTION CONTROL MEASURES

Both erosion and sediment controls are necessary for effective construction site management, as well as effective material management and site management practices. Protection of waterways and MS4 infrastructure from construction-related pollution is the ultimate objective of these practices. This section provides an overview of erosion and sediment control principles and information on Construction Control Measures.

6.1 Fundamental Erosion and Sediment Control Principles

6.1.1 Erosion

Soil erosion can generally be defined as the removal of soil by wind and water. Although soil erosion is a natural process, accelerated soil erosion occurs on construction sites due to activities that disturb the natural soil and vegetation.

6.1.2 Sedimentation

Sedimentation occurs when eroded soil transported by wind or water is deposited from its suspended state. During a typical rainstorm in Colorado, runoff normally builds up rapidly to a peak and then diminishes. Because the amount of sediment a watercourse can carry is dependent upon the velocity and volume of runoff, sediment is eventually deposited as runoff decreases. The deposited sediments may be resuspended when future runoff events occur. In this way, sediments are moved progressively downstream in the waterway system.

6.1.3 Effective Erosion and Sediment Control

The goal of effective erosion and sediment control is to minimize on-site erosion rather than to rely solely on sedimentation removal from construction site runoff. Erosion Control Measures limit the amount and rate of erosion occurring on disturbed areas. Sediment Control Measures attempt to capture the soil that has been eroded before it leaves the construction site. Despite the use of both erosion and sediment Control Measures, some amount of sediment will remain in runoff leaving a construction site, but the use of a "treatment train" of practices can help to minimize offsite transport of sediment. The last line of treatment, such as inlet protection and sediment basins, should be viewed as "polishing" Control Measures, as opposed to the only treatment on the site. Construction Control Measure Details, located in Appendix E, provide design details, installation notes, and maintenance guidance for effective use of various erosion and sediment control practices. Construction Control Measures should be combined and selected with the purpose of meeting these objectives:

- Effectively reduce accelerated soil erosion and reduce sediment movement and deposition off-site.
- Minimize the total amount of soil exposed at any given time.
- Limit the flow of water to non-erosive velocities for the conveyance of water around, through, or from the disturbed area.
- Remove sediment caused by accelerated soil erosion from surface runoff water before it leaves the site.
- Establish temporary or permanent cover on areas that have been disturbed as soon as practicable to minimize the total amount of soil exposed at any given time.

6.2 Minimum Design Requirements

The following general requirements apply to GEC Plans and CSWMPs. Designers must be aware of additional requirements included in the Construction Control Measure Details, located in Appendix E.

- Where feasible, temporary sediment basins or other adequate Construction Control Measure(s) must be installed for tributary areas greater than one acre.
- All runoff leaving a disturbed area shall pass through at least one Construction Control Measure before it exits the site.
- Erosion control blankets shall be installed in temporary swales with slopes greater than 2 percent once the swale is at interim final grade. Shear stress requirements must be evaluated against the erosion control blanket manufacturer specifications.

- Erosion control blankets shall be installed on all disturbed slopes greater than 3:1 once at final grade.
- Check dams shall be used in open channels with tributary areas larger than one acre.
- Whenever construction vehicles enter onto paved roads, provisions must be made to prevent the transport of sediment by vehicles tracking onto the paved surface.
- Temporary slope drains shall be used to convey stormwater down steep slopes.
- All storm sewer inlets made operable during construction must have inlet protection installed.
- Areas used for storage of chemicals, petroleum based products and waste materials, including solid and liquid waste, shall be designed to prevent discharge of these materials in the runoff from a construction site.

6.3 Alternative Construction Control Measures

The Permittee may coordinate with the Stormwater Enterprise to implement an alternative Construction Control Measure. Alternative Control Measures may or may not be proprietary in nature. A list of previously approved alternative Control Measures is included on the City website. If a Control Measure is not currently included as a standard detail or on the alternative Control Measures list, the process for adding an alternative Control Measure is as follows:

- Step 1: Permittee submits a legible detail of the proposed alternative, including installation and maintenance requirements, to their GEC Inspector or review engineer.
- Step 2: The GEC Inspector or review engineer will submit the proposed alternative electronically to the Alternative Control Measure Review Group, consisting of the Development Review Program Manager, Engineering Supervisor, Senior Technical Engineer, and area GEC Inspector / review engineer as applicable.
- Step 3: The review group will either approve or deny the use of the submitted alternative. If the proposed alternate is not approved, then the Permittee will be notified and no further action is required.
- Step 4: If the proposed alternate is approved, the Permittee will be notified and the detail will be added to the alternative Control Measures list.

The City reserves the right to deny the use of any proposed alternative Construction Control Measure, even if previously approved, if performance of the Construction Control Measure over time is deemed to be insufficient.

7.0 CONTROL MEASURES IN WATERWAYS

Construction in waterways is often required for projects including bridge construction, streambank stabilization and grade control. Construction in waterways requires a high standard of care to avoid and minimize damage to waterways, habitat, and aquatic life. This section provides guidance on specific Construction Control Measures that should be implemented, depending on site-specific conditions.

This work may require a Clean Water Act Section 404 Permit from United States Army Corps of Engineers (USACE), United States Fish and Wildlife Service (USFWS) threatened and endangered species permitting, and/or other state and local permits. Some required permits may restrict construction to certain times of the year. It is the Permittee's responsibility to ensure all required permits are in place prior to commencing construction activities.

In addition to commonly used Construction Control Measures, structural Control Measures that are specific to construction in waterways include:

- Streambank Stabilization
- Temporary Stream Crossing
- Temporary Diversion Channel
- Cofferdam or Rock Check Dam

Non-structural Control Measures that are frequently used for construction in waterways include:

- Construction Sequencing
- Seasonal Planning Considerations
- Limiting of Disturbed Areas

CHAPTER 4

CONSTRUCTION PHASE REQUIREMENTS

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1.0 PRIOR TO CONSTRUCTION

For the purposes of this chapter, the term GEC Permit applies to both the GEC Permit and the Associate GEC Permit.

1.1 Pre-Construction Meeting

GEC Inspectors must have the opportunity to attend a Pre-Construction Meeting prior to any land disturbance. The Permittee shall notify the GEC Inspector of the time and location of the Pre-Construction Meeting at least 72 hours prior to the scheduled meeting by calling (719) 385-5980. While it is not a requirement for GEC Inspectors to attend the meeting, the opportunity must be provided for all sites for which a GEC Permit will be obtained.

1.2 Scheduling Initial Inspection

After the GEC Permit has been conditionally approved and erosion control financial assurances have been posted, the Permittee shall contact the GEC Inspector to schedule an initial inspection at (719) 385-5980. The initial inspection must be scheduled 48 hours prior to construction. Prior to the initial inspection, the contractor must install the Initial Control Measures on-site, but no grading, clearing, or excavation is permitted at this time, except for work directly related to the installation of the Initial Control Measures. Initial Control Measures are defined in Chapter 1, Section 7.0.

1.3 Initial Inspections and Permit Execution

Initial inspections are performed to confirm Initial Control Measures are installed correctly and that the approved GEC Plan is being properly implemented. For more information regarding initial site inspections and permit execution, refer to Chapter 6.

2.0 DURING CONSTRUCTION

2.1 Basic Requirements

Implement the provisions of the GEC Plan and CSWMP as written and updated from commencement of construction activities until final stabilization is complete. Minor changes to the GEC Plan, including modifications to Construction Control Measures and/or the addition of Construction Control Measures not shown on the GEC Plan may be proposed by the GEC Administrator and approved by the GEC Inspector, or required at the discretion of the GEC Inspector. Any changes must be updated in the approved on-site GEC Plan. The GEC Administrator will submit a copy of the changes to the on-site GEC Plan to the GEC Inspector. Acceptable formats include pdf, jpg, jpeg, and png. The GEC Inspector will upload the relevant file and maintain

it with the other construction site records in the City's database to ensure that the GEC Inspector always has access to the current GEC Plan.

Any earth disturbance shall be conducted in such a manner so as to effectively reduce accelerated soil erosion and resulting sedimentation. All land disturbances shall be designed, constructed, and completed in such a manner so that the exposed area of any disturbed land shall be limited to the shortest practical period of time. All work and earth disturbance shall be done in a manner that minimizes pollution of any onsite or off-site waters, including wetlands.

Any street or drainage facility that has sediment deposited in it due to construction, grading, or any other development activity, must be cleaned immediately at the expense of the Permittee. If the street or drainage facilities are not cleaned immediately or within a period of time specified by the GEC Inspector, the City may perform the work or have the work performed and bill the responsible party.

2.2 On-Site Documentation

The Permittee or GEC Administrator shall maintain written or electronic records of all inspections, Control Measure maintenance, and any related communications. This documentation, along with the GEC Plan, CSWMP, and GEC Permit, is required to be available either physically or electronically at the construction site at all times. The documentation must be kept current until GEC Permit closeout. This documentation must be kept for three years after GEC Permit closeout.

2.3 Temporary Stabilization Requirements

Soil erosion Control Measures for all slopes, channels, ditches, or any disturbed land area shall be completed within fourteen (14) calendar days after final grading or final land disturbance has been completed. Disturbed areas which are not at final grade but will remain dormant for longer than fourteen (14) days shall be roughened, mulched, tackified, or stabilized with tarps within fourteen (14) days after interim grading. An area that is going to remain in an interim state for more than sixty (60) days shall also be seeded, unless an alternative stabilization measure can be justified and is accepted at the GEC Inspector's discretion. All Construction Control Measures shall be maintained until final stabilization is achieved.

2.4 Materials Exported from Site

Any export material taken off of a site will require proof of a permit for the final destination if required based on the guidelines in Chapter 2, Section 1.0. All stockpiles greater than 1000cy require perimeter control regardless of whether or not a GEC Permit is required.

2.5 Control Measure Maintenance Requirements

Throughout the life of the permit, erosion and sediment Control Measures and other protective measures identified in the GEC Plan shall be maintained in continuous, effective operating condition and in accordance with good engineering, hydrologic and pollution control practices, including removal of collected sediment in accordance with the specific maintenance requirements in Appendix E. Therefore, Permittees' routine site inspections must address maintenance of Control Measures that are found to no longer function as required and designed, as well as preventive maintenance to proactively ensure continued effective operation. More information on inspections and the required frequency of inspections can be found in Chapter 6.

Control Measures found to have failed during Permittees' routine self-inspections, or found to have the potential to fail without maintenance or modifications, must be addressed immediately to reduce the discharge or potential discharge of pollutants. Permittees must adopt good housekeeping measures to ensure that their sites stay in compliance with the GEC Permit. For example, such measures may include removing sediment buildup behind a perimeter Control Measure to avoid future failure. Streets within and immediately surrounding a construction site shall be cleaned of earth material daily. Scraped or swept material shall not be deposited directly behind curb Control Measures.

Additional or revised Construction Control Measures may be required at the GEC Inspector's discretion should construction site observation indicate current Control Measures are not adequately controlling erosion, sedimentation or stormwater runoff.

2.6 Permanent Control Measure Management During Construction

During construction, proposed Permanent Control Measures may be utilized as temporary Construction Control Measures under the following circumstances:

- The proposed Permanent Control Measure does not rely on infiltration;
- During construction, the proposed Permanent Control Measure's permanent outlet structure is protected according to details shown on the GEC Plan; and
- The following steps are taken to convert a Construction Control Measure to a proposed Permanent Control Measure:
 1. Consult with the GEC Inspector prior to beginning the conversion from Construction Control Measure to the proposed Permanent Control Measure to ensure that the timing is appropriate for the conversion to take place.
 2. Pump down basin using dewatering measures meeting state requirements. The effluent must be filtered. This activity may require a dewatering permit from CDPHE.

3. Remove accumulated sediment to establish the final grade of the Permanent Control Measure. Sediment must be disposed of properly following current regulations. If the Permanent Control Measure is a partially infiltrating Control Measure, excavate a minimum of 2 feet below the final grade of the Permanent Control Measure prior to placing filtration media.
4. Grade and roughen the bottom of the Permanent Control Measure to prepare it for seeding if required.
5. Complete installation of all required Permanent Control Measure features.
6. Permanently stabilize the Permanent Control Measure according to the GEC Plan or Permanent Control Measure Plan, as applicable.
7. After the conversion is complete, provide all required documentation related to ongoing maintenance of the Permanent Control Measure. Additional information can be found on the City website.

2.7 Management of the GEC Plan

The GEC Plan and CSWMP must be kept up to date under the supervision of the GEC Administrator to reflect current site conditions, current construction site activities and any field change that could impact stormwater management on site, including but not limited to modifications to Construction Control Measure type, size, or location. As construction progresses, locations of materials stored on site must be updated on the GEC Plan.

Plan changes may be undertaken by the permittee during the construction period to ensure continued effectiveness of existing Control Measures; however, certain amendments, as noted below, must be reviewed and approved by the Stormwater Enterprise prior to implementation. Depending on the magnitude of the change, the amendment will be approved either through the traditional plan review process or through coordination with the GEC Inspector. The required information for an amendment request shall be submitted by the GEC Administrator or the Permittee.

2.7.1 Major Changes

GEC Plan updates that require engineering calculations are considered to be major modifications, and design information shall be submitted by a Colorado licensed Professional Engineer licensed in the State of Colorado and reviewed and approved by the Stormwater Enterprise review staff. The process for major amendment requests is as follows:

- Prepare an amendment request in the City's Electronic Permitting Management System

- Submit the completed amendment request along with the revisions (according to the Stormwater Enterprise Electronic Document Policy) to the Stormwater Enterprise
- The revised plan must clearly indicate areas of revision using drafting clouds

Review fees will be assessed if applicable. If needed, additional financial assurances must be posted prior to approval of the amendment.

Major changes include, but are not limited to:

- Modification to the type of diversion in a waterway
- Modification of grading previously included in the approved GEC Plan
- Removal or modification of drainage or hydraulic features previously included in the approved GEC Plan
- Any other modifications to the GEC Plan that constitute a major change as determined by the GEC Inspector

2.7.2 Minor Changes

Minor changes to the GEC Plan, including modifications to Construction Control Measures and/or the addition of Construction Control Measures not shown on the GEC Plan may be proposed by the GEC Administrator and approved by the GEC Inspector, or required at the discretion of the GEC Inspector. The process for minor amendment requests is as follows:

- Prepare an amendment request in the City's Electronic Permitting Management System
- Submit the completed amendment request along with the revisions (in pdf, jpg, jpeg, or png) to the Stormwater Enterprise

Any changes must be also updated in the approved on-site or electronic GEC Plan. The GEC Inspector will review the relevant file and approve or deny the amendment request.

Examples of minor changes include, but are not limited to:

- Implementation of additional approved Construction Control Measures not shown on the approved GEC Plan
- Relocation of approved Construction Control Measures

- Adjustment of Construction Control Measures during a phase of construction
- Construction Control Measure substitution

2.8 Utility Projects

In addition to the above requirements, all utility construction shall comply with the following:

- Provide adequate erosion and sediment control at all times, and remove Construction Control Measures after project completion.
- For work within City streets, no more than 300 linear feet of trench shall be open at any one time.
- Trench and vault dewatering activities require appropriate Control Measures. Dewatering activities must also comply with all CDPHE requirements.
- Where consistent with safety and space considerations, place excavated material on the upgradient side of trenches.
- Evaluate potential for sediment contributions to inlets or receiving waters that are not in the immediate vicinity of the work area and implement inlet protection and/or other Control Measures as necessary.

2.9 Construction in Waterways

In addition to the above requirements, the general principles below must be followed:

- Construction vehicles should be kept out of a waterway as much as possible.
- Where in-channel work is necessary, steps such as temporary channel diversions must be taken to stabilize the work area and control erosion during construction where necessary as determined by the review engineer or GEC Inspector.
- When in-stream work has been completed, all disturbed areas must be stabilized using revegetation practices (often including use of erosion control matting or turf reinforced mats), riprap, or other permanent stabilization measures as required by the GEC Plan.
- Where an actively-flowing watercourse must be crossed regularly by construction vehicles, a temporary crossing must be provided. Three primary methods are available: (1) a culvert crossing, (2) a temporary bridge, and (3) a low water crossing.
- Additional permits are required according to state and federal regulations. For example, a permit may be required for the placement of fill in a waterway under Section 404 of the Clean Water Act. The local

office of the USACE should be contacted concerning the requirements for obtaining a 404 permit. In addition, a permit from USFWS may be needed if threatened or endangered species are of concern in the work area. Typically, the USFWS issues are addressed in conjunction with the 404 permit if one is required. Additional permits, such as a floodplain development permit, may also be required.

- Complete work in small segments, exposing as little of the channel at a time as practical. Keep equipment operators contained in the immediate work area and avoid excessive compacting of the soil surface because it inhibits revegetation.
- When feasible, it is best to perform in-channel work between October 1 and March 31 in Colorado. This is the period when the chances of flash floods and flows higher than the 2-year flood peak flows are less likely.
- During the process of cut and fill, avoid letting side-cast or waste material enter waterways or placing it on unstable areas. Instead, efficiently move excavated material to areas needing fill or to a stockpile. For stream restoration/stabilization projects, consulting with an engineer experienced in stream stabilization on stream stability issues may be prudent.
- Special consideration should be given to seasonal effects on revegetation. For example, successful Willow staking, brush layering, installation of wetland plugs, etc. is highly dependent on the time of year.

2.10 Permit Transfers

GEC Permittees remain responsible for permit compliance on their site until their permit is completely closed out as described in Chapter 6 of this Manual, or until the entire GEC Permit is transferred.

GEC Permits may be transferred from one party to another upon submittal of a transfer request. Transfer requests must be approved by the City prior to the transfer taking effect. Both parties must consent to the transfer with the new Permittee accepting the plan responsibilities and liabilities. Financial assurances (see the Engineering Criteria Manual) must be in place for the GEC Plan before and after the permit transfer.

Upon transfer of the Permit, the new Permittee is required to follow the existing GEC requirements as approved in both the GEC Plan and CSWMP. The new permittee may elect to develop their own GEC Plan and submit it for approval through the standard City review process. Review fees shall apply. The new GEC Plan shall be submitted, reviewed and approved prior to transferring the permit.

3.0 AFTER CONSTRUCTION IS COMPLETE

All temporary Construction Control Measures may not be removed until all on-site areas tributary to the Construction Control Measures have achieved final stabilization. It is necessary to maintain Control Measures until the upgradient areas have been fully stabilized and vegetation has sufficiently matured to provide adequate cover, defined as meeting the requirements for final stabilization according to Chapter 5. Land disturbance resulting from the removal of Control Measures must be repaired and stabilized.

With few exceptions, temporary Construction Control Measures must be removed prior to a final inspection and GEC Permit closeout by the City. The final inspection must be passed prior to release of any financial assurances. For some Construction Control Measures such as sediment control logs, some materials may be biodegradable (straw), but there may be components of the Control Measure that biodegrade slowly (stakes) or not at all (plastic netting). Construction Control Measure components that are non-biodegradable must be fully removed.

Permit closeout requirements are detailed in Chapter 7.

CHAPTER 5

NATIVE VEGETATION REQUIREMENTS AND GUIDELINES

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1.0 APPLICABILITY

When areas disturbed by construction activities require temporary or permanent revegetation that is not included in a Landscaping Plan, the requirements below must be followed by the Permittee.

2.0 STABILIZATION REQUIREMENTS AND GUIDELINES

2.1 Site Preparation

The following requirements apply to site preparation for revegetation:

- In areas to be seeded, the upper 6 inches of the topsoil must be in a friable condition and not heavily compacted.
- Areas to be planted shall have at least 4 inches of topsoil suitable to support plant growth. Native topsoil, when applicable, must be stripped and saved for this purpose.

If, after one year following seed application, revegetation has not established in accordance with the performance standards included in this manual, the following will be required:

- Soil testing must be performed prior to subsequent seeding efforts. Soil testing is not required on every lot for Associate GEC Permits.
- Soil amendments or fertilizer must be added to correct topsoil deficiencies (e.g., nutrients, pH, organic matter, salinity) based on the soil testing results.
 - If fertilizer is used, slow-release type fertilizers must be used to encourage target vegetation and protect water quality.
 - Soil amendments and/or fertilizer must be worked into soil during seedbed preparation if necessary.

All soil testing, soil amendment and fertilizer documentation, and seed load and bag tickets must be added to the CSWMP.

The following guideline also applies to site preparation for revegetation:

- The City recommends that existing and/or imported topsoil be tested to identify soil deficiencies and any soil amendments necessary to address these deficiencies. Soil amendments and/or fertilizers should be added to correct topsoil deficiencies based on the soil testing results.

2.1.1 Stripping and Stockpiling Topsoil

Topsoil shall be protected during the construction period to retain its structure, avoid compaction, and to prevent erosion and contamination. Stripped topsoil must be stored in an area away from machinery and construction operations, and care must be taken to protect the topsoil as a valuable commodity. Topsoil must not be stripped during undesirable working conditions (e.g., during wet weather or when soils are saturated). Topsoil shall not be stored in swales or in areas with poor drainage.

At a minimum, enough topsoil must be stripped and stored to provide for at least 4 inches of spread topsoil in revegetation areas. If not enough topsoil is available on the site, additional topsoil must be imported.

Topsoil should be stored in piles or rows no more than four feet deep where possible to keep soil organisms alive until the topsoil is reinstalled.

Stockpiles on sites which are not at final grade but will remain dormant for an extended period of time may require additional stabilization measures at the inspector's discretion. All Construction Control Measures shall be maintained until permanent stabilization is achieved.

2.1.2 Imported Topsoil

Depending on site conditions, it may be necessary to import topsoil from off-site. When topsoil from off-site is used, good quality, certified weed-free topsoil must be used. Documentation containing chemical characteristics and weed-free certification must be added to the CSWMP. Topsoil quality must be verified through soil testing, with topsoil of acceptable quality meeting these characteristics:

- A loamy texture with balanced proportions of sand, silt and clay.
- Chemical characteristics:
 - Soil reaction (pH): 5.5 – 7.8
 - Organic Matter Content: 3%
 - Soluble Salt Content (conductivity): <0.8 dS/m for soil: water ratio of 1:2
 - Nitrogen: 15 – 20 ppm (typically must be added)
 - Phosphorus: 10 – 15 ppm (Olson bicarbonate method); 20 – 30 ppm (Mehlich III method)
 - Potassium: 50 – 200 ppm
 - Magnesium: 2.0 – 5.0 ppm

- Sulfur: 2.0 – 5.0 ppm (typically must be added)
- Zinc: 1.0 – 1.5 ppm
- Clean and uncontaminated with chemicals or debris.

2.1.3 Soil Amendments

The following section contains information and recommendations related to soil testing.

It is essential that those responsible for the landscapes understand what constitutes a good soil for plant growth and how to improve poor soil conditions. Theoretically, a good soil is one that supports optimum plant growth and is commonly referred to as an “ideal” soil. The characteristics of an ideal soil are a combination of physical properties and chemical compositions and their interactions. Both are interrelated and it is almost impossible to alter one without affecting the other.

An ideal soil generally includes these characteristics:

- 50% porosity in the soil, with half of that porosity allowing easy circulation of air into and out of the soil to a depth of at least 18 inches.
- An adequate organic matter content – equal to 2% or greater of the total soil volume.
- Good water-holding capability.
- A favorable range of soil pH (5.5 – 7.8).
- The presence of optimum levels of nutrients in available forms and the ability to exchange nutrients driven by the desired plant type.
- The soil texture is a loam with roughly equal proportions of sand, silt and clay particle sizes.

Soil test results for a site can be compared against these characteristics of an ideal soil and deficiencies can be corrected based on test results. Careful soil sampling and proper laboratory analysis are essential for accurate soil amendment recommendations.

Soil tests can be obtained by mailing or delivering a sample to one of the approved laboratories listed in Section 2.1.5. The sample should be collected in a soil sample bag provided by the laboratory following the protocol in Section 2.1.4 and be accompanied by a “Soil Sample Information Form.” The form outlines the types of analyses that can be conducted and explains the proper procedure for collecting a soil sample.

2.1.4 Soil Sample Collection Protocol

Colorado State University Extension Service provides guidance on collection of soil samples for testing. This guidance is available on the Colorado State University [website](#).

2.1.5 Soil Testing Laboratories

Soil samples must be tested by a professional soil testing laboratory. Soil analyses should include a soil organic matter measurement and recommendations for fertilizer and amendment rates for the vegetation type to be planted.

Local companies and laboratories in Colorado and neighboring states that conduct soil testing include:

American Analytical Laboratories
2773 Downhill Drive
Steamboat Springs, CO 80487
970.879.6593

Midwest Laboratories
13611 B Street
Omaha, NE 68144
402.334.7770

Ward Laboratories
4007 Cherry Avenue
Kearney, NE 68847
800.887.7645

Colorado Analytical Laboratory
10411 Heinz Way
Henderson, CO 80640
303.659.2313

Colorado State Soil, Water and
Plant Testing Laboratory
Room A320 NES Building
Fort Collins, CO 80601
970.491.0561

Weld Laboratories
1527 1st Avenue
Greeley, CO 80631
970.353.8118

2.1.6 Soil Amendments

Soil amendments are required to be applied to correct deficiencies, if identified, based on the results of soil tests. Effective use of soil amendments includes both selection of appropriate soil amendments and proper application of the soil amendments, as discussed below. More detailed information regarding soil amendments can be found in the City of Colorado Springs Landscape Code and Policy Manual. Generally, organic matter needs to be added to most soils in Colorado Springs in order to meet a minimum of 2% organic matter by volume.

2.1.7 Fertilizer

Inorganic and organic fertilizers are commonly used to increase the nutrient content of soils. Nitrogen (N), phosphorus (P), and potassium (K) are the primary nutrients required for plant growth. Deficiencies in secondary nutrients, such as magnesium (Mg), and micronutrients, such as iron (Fe) also occur on occasion. Fertilizer should be applied in accordance with manufacturer and soil testing laboratory recommendations to correct nutrient deficiencies consistent with soil test results.

2.1.8 Compost

Typically, the most cost-effective soil amendment to achieve the required minimum organic matter content is compost. Compost is a product resulting from the controlled biological decomposition of organic material, often biosolids or manure that has been stabilized to the point that it is beneficial to plant growth and generally safe for public contact. Compost should be Class A as defined by CFR Title 40, Part 503.

As a part of the site soil testing effort, a sample of the proposed organic amendment being used should also be tested. This will enable the soil testing laboratory to recommend an exact application rate for the proposed amendment. Compost should be applied in accordance with manufacturer and soil testing laboratory recommendations. At a minimum, compost should be applied and incorporated into the top 6 inches of soil at a sufficient rate to achieve 2% organic matter by volume.

2.1.9 Other Amendments

In addition to traditional soil amendments, other products show promise as soil conditioners and sources of slow-release fertilizers for revegetation efforts. Proprietary products must be presented to the GEC Inspector for approval, and must be approved by the Stormwater Enterprise prior to use.

2.1.10 Applying Soil Amendments

To apply soil amendments, the following steps are recommended:

1. Where seeding will occur, mix the organic matter into the soil in a homogeneous manner at least 6 inches deep. Do not allow large pockets of unmixed material to remain intact because this can suffocate new seedlings and may compact and shed water instead of rapidly absorbing it.
2. Apply and rototill amendments only when the soil is in good working condition.
3. Always avoid organic matter that has not thoroughly decomposed to a non-active, non-burning condition. Fresh or "green" manure should never be used because it contains concentrations of chemicals and can be particularly hazardous to germinating seedlings or new plant roots. Actively decomposing organic matter uses large quantities of nitrogen in the decomposition process and can actually reduce soil fertility levels.
4. Know the nature of the soil amendment or have it tested to determine potential problems, such as weed seeds and soluble salts. Under some circumstances, manure can add to the accumulation of soil salt and introduce undesirable weeds.

As with any construction activity, appropriate equipment must be used to achieve the desired result. The only appropriate method of incorporating large quantities of organic matter thoroughly is by rototilling with heavy equipment that is capable of a 6- to 8-inch cultivating and mixing depth. Discing and harrowing have been found to be inadequate and should not be used.

2.1.11 Grading and Compaction

In areas to be seeded, the upper 6 inches of the soil must not be heavily compacted and should be in a friable condition. Less than an 85% standard proctor density is acceptable. Areas of compaction or general construction activity must be scarified to a depth of 6 to 12 inches prior to spreading topsoil to break up compacted layers and provide a blending zone between different soil layers.

2.2 Seeding

Seed mixtures should be sown at the proper time of year for the mixture. The following requirements and recommendations apply:

- For irrigated native seed projects, seeding should occur between May 1 and August 1. Seeding after August 1 may not allow warm season grasses to grow large enough to survive the winter and may result in poor coverage.
- For non-irrigated projects, seeding should occur between November 15 and April 15.
- Seed should be drill-seeded whenever possible.
 - Seed depth must be 1/3 to 1/2 inches when drill-seeding is used.
 - Cross drilling (double drilling) should be used whenever possible. The seed should be divided between the two operations, drilling the second seed application perpendicular to the first.
 - Drill seeding must be completed with a drill seeding machine equipped with seed boxes designed to plant warm and cool season native grass seed.
- Broadcast seeding or hydro-seeding with tackifier may be substituted on slopes steeper than 3:1 or on other areas not practical to drill seed at the discretion of the GEC Inspector.
 - Seeding rates must match the amounts as shown in Section 4.0 for broadcast seeding or hydro-seeding.
 - Broadcast seed must be lightly hand-raked into the soil.
- Seeded areas shall be mulched, and the mulch must be adequately secured.

2.3 Mulching

Mulching should be completed as soon as practicable after seeding, however planted areas must be mulched no later than 14 days after planting. Mulching requirements include:

- Hay or straw mulch
 - Only certified weed-free and certified seed-free mulch may be used. Mulch must be applied at 2 tons/acre and adequately secured by crimping and/or tackifier.
 - Crimping must not be used on slopes greater than 3:1 and mulch fibers must be tucked into the soil to a depth of 3 to 4 inches.
 - Tackifier must be used in place of crimping on slopes steeper than 3:1.
- Hydraulic mulching
 - Hydraulic mulching is an option on steep slopes or where access is limited.
 - If hydro-seeding is used, mulching must be applied as a separate, second operation.
 - Wood cellulose fibers mixed with water must be applied at a rate of 2,000 to 2,500 pounds/acre, and tackifier must be applied at a rate of 100 pounds/acre.
- Erosion control blanket
 - Erosion control blanket may be used in place of traditional mulching methods.

2.4 Temporary Irrigation

Due to the semi-arid climate and drying winds in Colorado Springs, evapotranspiration exceeds natural precipitation. Temporary irrigation is highly recommended for quickly establishing vegetative cover. Temporary irrigation is required on sites where revegetation efforts have failed (70% of the pre-disturbance vegetative density was not achieved) 12 months after initial seeding.

2.4.1 Site Evaluation

The evaluation and use of irrigation must be coordinated with City Planning if a Landscaping Plan is required.

2.4.2 Method of Irrigation

When needed, temporary irrigation is typically delivered by temporary surface pipes or in-ground pipes.

- Temporary Surface Pipes (above grade): Surface pipes can provide an adequate water supply if properly designed and operated. However, they are susceptible to damage due to vehicle traffic, wildlife, vandalism and exposure to the sun. All visible temporary irrigation components must be removed within 1 year after the system is no longer in use.
- In-Ground Pipes: In-ground pipes can provide the most reliable method of delivering an adequate water supply if properly designed and operated and is the recommend type of irrigation. These systems are less susceptible to damage and may be abandoned in place with less impact to the site.

2.4.3 Water Sources

There are multiple options for irrigation water sources. They include city domestic (potable) water and nonpotable water (groundwater, raw surface water and reclaimed (tertiary-treated) water). The use of any nonpotable water requires approval through Colorado Springs Utilities. This approval includes verification of the applicable water right(s) and user compliance with applicable Colorado Springs Utilities Standards. The use of gray water (wastewater from sources other than toilets, urinals, kitchen sinks, non-laundry utility sinks and dishwashers) may also be an option, but would require coordination and approval through several entities including Colorado Springs Utilities, the El Paso County Department of Health, and the Pikes Peak Building Department.

2.4.4 Preparing an Irrigation Plan

When required, an Irrigation Plan must be prepared in conformance with the City of Colorado Springs Landscape Code and Policy Manual.

2.5 Performance Standard for Vegetation Establishment

Required vegetation coverage for final stabilization is defined as follows:

- Uniform vegetative cover must be established with an individual plant density of at least 70% of the pre-disturbance vegetative density as determined from pre-disturbance photographs, or equivalent permanent, physical erosion reduction methods must be employed.
- The vegetation shall be uniform and of the variety and species found in the City approved mixes or in the approved GEC Plan. Noxious weeds may not be counted in the vegetative density. The City will use pre-disturbance photographs to determine the required coverage area.
- The number and size of non-vegetated areas within the area of land disturbance shall be reviewed and evaluated by the GEC Inspector during the Final Inspection. This evaluation shall take into account the following at a minimum:

- Even coverage across area of land disturbance (no large visible bare spots),
 - Location of non-vegetated areas (i.e. next to an inlet would be an area of concern),
 - Type of vegetation established (weeds vs. target species), and
 - Lack of visible erosion within the site.
- If a nurse crop has been utilized on this site, at least half of the 70% of the counted vegetation must be of the targeted species.

Additional and post-construction revegetation and stabilization requirements are specified in the Landscape Code and Policy Manual.

2.6 Managing Noxious Weeds

Managing noxious weeds is a key component of successful revegetation and habitat restoration. Early detection and rapid response is the preferred method of eradication. For more information involving mitigation measures, refer to the El Paso County [Noxious Weeds Website](#).

3.0 FINAL STABILIZATION PROCEDURE

Before scheduling a Final Inspection, while waiting for vegetation to establish, Permittee(s) shall complete the following inspections and maintenance operations:

1. Fill any eroded rills and gullies with topsoil prior to any reseeding.
2. Ensure all disturbed areas are seeded and mulched according to the City Stormwater Construction Manual.
3. Inspect seeded and mulched areas, as well as the stormwater management system, at least once every month. If repairs are needed, reseed and re-mulch/blanket the site as needed or as recommended by the GEC Inspector for areas failing to meet the required coverage.
4. Control noxious weeds in a manner acceptable to the GEC Inspector.

In addition, GEC Inspectors will make periodic inspections of the revegetation area and stormwater management system. The frequency may be evaluated and adjusted by the Stormwater Enterprise.

4.0 SEED MIXES

The following seed mixes must be used unless a custom grass seed mix is approved. The seeding rates must match the amounts shown in the seed mixes below, at a minimum.

Projects requesting a custom grass seed mix should contain at least 90% native species and should not include the prohibited species crested wheatgrass (*Agropyron cristatum*) or smooth brome (*Bromus inermis*). A species will be considered native if it is listed as a species native to Colorado in the USDA Plants Database (plants.usda.gov). The custom grass seed mix should be made after consultation with a qualified revegetation specialist and submitted to the Stormwater Enterprise and City Planning (if applicable) for review and approval.

The following seed mixes should not be used in highly visible small landscape spaces (under 8 feet wide). See the City of Colorado Springs Landscape Code and Policy Manual for more information on permanent landscaping requirements.

Table 5-1. El Paso County Conservation District All-Purpose Mix for Upland, Transition and Permanent Control Measure Areas

Common Name	Scientific Name	Growth Season / Form	% of Mix	Pounds PLS		
				<ul style="list-style-type: none"> • Irrigated broadcast • Irrigated hydroseeded 	<ul style="list-style-type: none"> • Non-irrigated broadcast • Non-irrigated hydroseeded • Irrigated drilled 	<ul style="list-style-type: none"> • Non-irrigated drilled
				80 seeds/sq ft	40 seeds/sq ft	20 seeds/sq ft
Bluestem, big	<i>Andropogon gerardii</i>	Warm, sod	20	4.4	2.2	1.1
Grama, blue	<i>Bouteloua gracilis</i>	Warm, bunch	10	0.5	0.25	0.13
Green needlegrass ²	<i>Nassella viridula</i>	Cool, bunch	10	2	1	0.5
Wheatgrass, western ²	<i>Pascopyrum smithii</i>	Cool, sod	20	6.4	3.2	1.6
Grama, sideoats	<i>Bouteloua curtipendula</i>	Warm, bunch	10	2	1	0.5
Switchgrass ²	<i>Panicum virgatum</i>	Warm, bunch/sod	10	0.8	0.4	0.2
Prairie sandreed	<i>Calamovilfa longifolia</i>	Warm, sod	10	1.2	0.6	0.3
Yellow indiagrass ²	<i>Sorghastrum nutans</i>	Warm, sod	10	2	1	0.5
Seed rate (lbs PLS/acre)				19.3	9.7	4.8

¹For portions of facilities located near or on the bottom or where wet soil conditions occur. Planting of potted nursery stock wetland plants 2-foot on-center is recommended for sites with wetland hydrology.

²Species that will do well in the bottom of pond areas.

Table 5-2. El Paso County All-Purpose Low Grow Mix for Upland and Transition Areas

Common Name	Scientific Name	Growth Season / Form	% of Mix	Pounds PLS		
				<ul style="list-style-type: none"> • Irrigated broadcast • Irrigated hydroseeded 80 seeds/sq ft	<ul style="list-style-type: none"> • Non-irrigated broadcast • Non-irrigated hydroseeded • Irrigated drilled 40 seeds/sq ft	<ul style="list-style-type: none"> • Non-irrigated drilled 20 seeds/sq ft
Buffalograss	<i>Buchloe dactyloides</i>	Warm, sod	25	9.6	4.8	2.4
Grama, blue	<i>Bouteloua gracilis</i>	Warm, bunch	20	10.8	5.4	2.7
Grama, sideoats	<i>Bouteloua curtipendula</i>	Warm, bunch	29	5.6	2.8	1.4
Green needlegrass	<i>Nassella viridula</i>	Cool, bunch	5	3.2	1.6	0.8
Wheatgrass, western	<i>Pascopyrum smithii</i>	Cool, sod	20	12	6	3
Dropseed, sand	<i>Sporobolus cryptandrus</i>	Warm, bunch	1	0.8	0.4	0.2
Seed rate (lbs PLS/acre)				42	21	10.3

CHAPTER 6

INSPECTION AND ENFORCEMENT

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1.0 COORDINATION WITH THE CITY

1.1 What to Expect

Once the initial inspection for the construction site has been successfully completed and the permit executed, further inspections shall be conducted throughout the duration of construction and until permit closeout. Inspections are performed by both the GEC Inspector and the Permittee or GEC Administrator. Routine and post-storm event inspections of Control Measures are essential to identify maintenance necessary for the Control Measures to remain in effective operating condition. It is the responsibility of the permittee to take all necessary measures to ensure that the site is in compliance with local and state requirements, the GEC Plan, and the CSWMP. For the purposes of this chapter, GEC Permit refers to both GEC Permits and Associate GEC Permits.

1.2 How to Comply

To protect stormwater quality and maintain permit compliance, the permittee shall be prepared for inspections at all times. The construction site must be routinely checked by the permittee and GEC Administrator for proper Control Measure installation, and to determine if Construction Control Measures continue to function effectively and appropriately in accordance with the GEC Plan and CSWMP. Any loss of integrity or loss of function identified shall be repaired immediately to reduce the potential for stormwater to transport sediment and other pollutants into the City's MS4 or off-site. If it is infeasible to install or repair the Control Measure immediately after discovering the deficiency, the following must be documented and kept with the site inspection records:

1. Describe why it is infeasible to initiate the installation or repair immediately; and
2. Provide a schedule for installing or repairing the Control Measure and returning it to an effective operating condition as soon as possible. All issues must ultimately be resolved within 3 calendar days after the noncompliance issue is first identified.

2.0 INSPECTION PROCESS

The following sets forth how inspections will be performed at construction sites within the City. The City shall have the right to enter the construction site at any time to determine if the site is in compliance with the plan. The City's review of the GEC Plan is the first step in determining the type of inspections needed and the relative priority of the site for inspections. **Inspections performed by GEC Inspectors do not fulfill the requirement for self-inspections to be conducted by the Permittee or GEC Administrator.**

2.1 Initial Inspection

Initial inspections are performed by the GEC Inspector to confirm that the approved plan is being implemented properly. Initial Control Measures must be implemented according to the approved GEC Plan at the time of the initial inspection. The initial inspection also serves to establish contact between inspectors and the site personnel responsible for implementing the approved plans. **No land disturbance or construction activities may occur prior to the initial inspection, with the exception of Initial Control Measure installation. No stockpiling of materials is permitted prior to the initial inspection.** The GEC Inspector will verify that Initial Control Measures have been properly installed, take pre-disturbance photographs, and discuss self-inspection requirements with the site GEC Administrator at the initial inspection. Additionally, dewatering measures will be discussed, including State dewatering permit requirements as applicable.

2.2 Self-Inspections

The GEC Administrator is required to conduct self-inspections. The purpose of these inspections is to ensure that all Control Measures are installed according to the approved plans, appropriate as to the intended use, operating effectively, and being properly maintained. The GEC Administrator must be qualified according to Chapter 2, Section 5.0.

The GEC Administrator shall, at a minimum, make a thorough inspection at least once every 14 calendar days. Also, post-storm event inspections must be conducted within 24 hours following the end of any precipitation or snowmelt event that causes surface erosion. Provided the timing is appropriate, the post-storm inspections may be used to fulfill the 14-day routine inspection requirement. Alternatively, the GEC Administrator may choose to perform self-inspections every 7 calendar days and forego post-storm event inspections. The self-inspection schedule must be identified in the GEC Administrator's most recent self-inspection. A more frequent inspection schedule than the minimum described may be necessary to ensure that Control Measures continue to operate as needed to comply with the GEC Plan. Site conditions such as steep grades and close proximity to a state water are reasons for increasing the frequency of self-inspections.

The GEC Administrator shall submit documentation of the self-inspections by uploading the document to the City's Electronic Permitting Management System. **Completed self-inspection forms must be submitted electronically within 5 business days of the self-inspection.** The self-inspections must also be available either physically or electronically at the construction site at all times throughout the duration of the project. GEC Inspectors will review self-inspections during City compliance inspections. The use of a third-party inspection program does not remove this requirement. Additionally, the use of a third-party inspection program does not relieve the Permittee of the requirement to comply with all compliance inspections.

For sites or portions of sites where construction activities have been completed and final stabilization measures installed but final stabilization has not yet been achieved, the GEC Administrator shall make a thorough inspection of their Control Measures at least once every month. Post-storm event inspections must be

conducted within 72 hours following the end of any precipitation or snowmelt event that causes surface erosion. The GEC Plan must be amended to indicate those areas where construction activities have been completed but final stabilization has not yet been achieved that will be inspected once a month.

When site conditions make the schedule required in this section impractical, the permittee may petition the City to grant an alternate inspection schedule. The alternative inspection schedule may not be implemented prior to written approval by the City and incorporation into the CSWMP.

The Permittee is responsible to confirm that the frequency of inspections is sufficient to ensure that Control Measures remain in good working condition at all times.

2.2.1 Correction of Deficiencies

The Permittee and GEC Administrator are responsible to ensure and document that Control Measures are maintained when and where deficiencies have been noted on self-inspections. When Control Measures have failed as determined by the GEC Administrator, they must be addressed as soon as possible, immediately in most cases, to minimize the discharge of pollutants. All issues must ultimately be resolved within 3 calendar days after the noncompliance issue is first identified.

2.3 City Compliance Inspections

Compliance inspections are performed by GEC Inspectors. Sites will be inspected every 56 days during November to March then every 28 days for the remainder of the year, but also may occur randomly. In general, all sites with a GEC Permit and directly connected Associate GEC Permits will be inspected on the same compliance inspection schedule.

During a compliance inspection, the GEC Inspector will verify that the latest self-inspection report accurately reflects site conditions, that Control Measures are functioning according to design, and that only allowable discharges are occurring. The GEC Inspector also will verify that the GEC Plan is updated to reflect current Control Measure activity.

If a State inspection has been performed on the site between the previous compliance inspection and the current compliance inspection, the GEC Inspector will review the preliminary State inspection report and determine whether inconsistencies exist. Inconsistencies mean that during the State inspection the following site conditions exist that were not reflected in the City's previous compliance inspection: (1) there are missing or damaged Control Measures at the site; (2) illicit discharges are observed; and/or (3) sediment is observed in the inlets. If inconsistencies between the State and the City's most recent compliance inspection are found, the GEC Inspector will follow enforcement procedures in Section 4.0 if applicable.

Minor changes to the GEC Plan, including modifications to Construction Control Measures and/or the addition of Construction Control Measures not shown on the GEC Plan may be required at the discretion of the GEC

Inspector. The City will approve the updated on-site GEC Plan according to Chapter 4 Section 2.7. Multiple minor changes to the same area of the site on the GEC Plan can lead to confusion for the party implementing the GEC Plan and may require an updated GEC Plan, reflecting the changes, to be submitted to the City.

When a GEC Inspector identifies the need for Control Measure maintenance, the GEC Inspector will notify the Permittee or GEC Administrator of the required actions. The date the GEC Inspector identified the need for Control Measure maintenance is the first day of non-compliance. Additional enforcement policies are discussed in Section 4.0.

2.4 Complaint Response Inspections

An inspection may occur in response to a complaint received by the City from citizens or other entities. The GEC Inspector may inform the Permittee or GEC Administrator of the complaint. The GEC Inspector will investigate the complaint and, if necessary, advise on the required repair, maintenance and/or cleanup. The GEC Inspector may also require the implementation of corrective measures including requiring additional Control Measures to prevent the recurrence of the problems that gave rise to the complaint. All sites with construction activities are subject to complaint response inspections, regardless of whether or not there is an active permit for the site. The City will retain records of complaints in a City data tracking system.

2.5 Follow-Up Inspections

Follow-up inspections may be conducted to ensure that required action noted from a previous City inspection has been performed. Required action may involve the cleanup of a discharge, implementing additional or revised Control Measures, and/or repairing, reinstalling, or maintaining damaged or non-functioning Control Measures. All construction sites are subject to follow-up inspections. Refer to Section 4.0 for information relating to the timing of follow-up inspections and additional enforcement procedures.

2.6 Final Inspections

A final inspection of the site will be conducted by the GEC Inspector to determine compliance with the GEC Plan and to determine if the site is stabilized prior to final approval. The final inspection must be passed prior to close-out of the GEC Permit, as detailed in Chapter 7. The GEC Inspector must be contacted by the Permittee or GEC Administrator at least 48 hours prior to scheduling the final inspection. The inspection serves to verify the following:

1. All work is in compliance with the approved GEC Plan, and all stabilization is completed, including vegetation and other approved measures.
2. Final stabilization is reached when all ground surface disturbing activities at the site have been completed, and uniform vegetative cover has been established with an individual plant density of at

least 70 percent of pre-disturbance plant density levels as determined from pre-disturbance photographs, or equivalent permanent, physical erosion reduction methods have been employed.

3. Removal of all temporary Construction Control Measures.
4. Correct installation of all approved Permanent Control Measures and acceptance of the associated documentation, if required.
5. Removal of all stockpiles, construction material/debris, construction equipment, etc.
6. Streets, parking lots and other paved surfaces (on-site and off-site as appropriate) are clean.
7. Removal of sediment and debris from drainage facilities (on-site and off-site as appropriate).
8. All impacts to off-site properties caused by the construction activity, including proper restoration of any damaged property are addressed.

3.0 INSPECTION OUTCOME

In general, City GEC Inspections result in the following:

1. A City GEC inspection report is provided to the Permittee or the GEC Administrator.
2. The report identifies one of the following situations:
 - Passing Inspection: Only working items have been identified. No violations are noted on the GEC inspection report.
 - Failing Inspection: Results in a follow-up inspection. See Section 4.0, Enforcement, for enforcement policies.
 - Letter of Non-Compliance: Violations are noted. See Section 4.0, Enforcement, for enforcement policies.
 - Stop Work Order: Depending on the severity, egregiousness, magnitude and frequency of violations, a stop work order may be issued during any City GEC inspection. See Section 4.0, Enforcement, for enforcement policies.

4.0 ENFORCEMENT

The City will ensure compliance with the GEC Permit through enforcement measures. Owners, developers, and contractors must take the necessary measures to ensure that their construction sites do not create negative impacts to public safety, property, or water resources. **Ultimately, the GEC Permittee is responsible for ensuring compliance with the GEC Permit conditions by all on-site personnel including but not limited to construction contractors, builders, and individual lot owners operating within the area covered by the GEC Permit.**

4.5 Enforcement Policies

4.5.1 Enforcement Strategy

The following policies apply to enforcement at construction sites in the City of Colorado Springs.

1. It will be the policy of the City of Colorado Springs to require compliance with grading, erosion and stormwater quality control requirements by working with engineers and developers during the design and implementation phases of a project to incorporate proper Construction Control Measures.
2. The City will take enforcement action on a site as necessary to ensure proactive compliance with Control Measure implementation and maintenance. The intent will be to initiate the enforcement process to correct deficiencies and to motivate construction site violators.
3. The Permittee is the ultimate responsible party for all construction activities. It is the responsibility of the Permittee to take all necessary measures to ensure that the site is in compliance with City ordinances, the GEC Plan, and the CSWMP.
4. The City has made every effort to make its requirements consistent with State requirements for construction activities (CDPS General Permit – Stormwater Discharges Associated with Construction Activities). Should requirements conflict, it will be the responsibility of the Permittee to bring these conflicts to the City's attention and propose how to address them.
5. Whenever a Stop Work Order is issued, it will be the City's policy to stop any or all City activities or further approvals relative to the site until the necessary measures are taken to address the concerns, as stipulated in the Stop Work Order. The SWENT Manager may also use partial Stop Work Orders, when deemed appropriate.

There are several situations where the City may determine that more aggressive action is necessary to get the site into compliance with the GEC Permit. The first situation is when there are impacts on public safety, property or water resources. This could include, but is not limited to, the deposition of sediment on a roadway that has

the potential to cause accidents, the wash out of channels, spills of toxic materials, deposition of sediment that causes or has the potential to cause property damage, or the deposition of materials into water ways. The magnitude of the impacts will determine what action is appropriate.

Another instance that may result in more aggressive action involves chronic and recalcitrant behavior by the Permittee. Problems that may warrant such action include:

1. Where the same problem is reoccurring at the site.
2. Where the site appears to be having frequent minor problems.
3. The individuals involved have a history of noncompliance.

There are several options for formal action that are available to the City. The City may take other action as deemed appropriate. Ultimately, the GEC Inspector has the authority to escalate enforcement steps when appropriate.

4.5.2 Enforcement of Permitted Sites

The following policies apply to enforcement at all permitted sites covered by GEC and Associate GEC Permits in the City. The City retains all its options concerning its chosen enforcement approaches and compliance is required at all times.

The following are the escalation guidelines for violations involving permitted construction sites:

1. Upon determining that a violation has occurred, the GEC Inspector will promptly contact the Permittee. The Permittee will be informed of the violation, requested to cease and desist from engaging in the prohibited activity, and/or correct a deficiency, and/or remediate the property to its prior condition. Where Control Measures have failed, resulting in noncompliance, they must be addressed as soon as possible, and immediately in most cases, to minimize the discharge of pollutants. In all cases the deficiency must be corrected within three (3) calendar days.
2. The GEC Inspector will document the date and substance of the conversation.
3. The Permittee or GEC Administrator must provide written and photographic documentation within the three (3) calendar day period that the prohibited activity has ceased, been corrected, and/or remediation is complete. If this documentation is found to be adequate, the City reserves the right to consider this an appropriate follow-up.
4. The GEC Inspector may conduct a follow-up inspection after the expiration of the three (3) calendar day period within five (5) business days following the verbal meeting. If a follow-up inspection occurs,

the GEC Inspector will document whether or not the prohibited activity has ceased, the deficiency has been corrected, or the property has been remediated.

5. If the Permittee fails to send appropriate documentation, cease the prohibited activity, correct the violation, and/or remediate the property, the GEC Inspector will issue a Letter of Non-Compliance notifying the Permittee that the violation is persisting, needs to be ceased, corrected, and/or the property remediated immediately, and the possible escalation consequences. This letter will be sent to the Permittee.
6. The Permittee must provide written and photo documentation within the three (3) calendar day period that the prohibited activity has ceased, been corrected, and/or remediation is complete. If this documentation is found to be adequate, the City reserves the right to consider this an appropriate follow-up.
7. The GEC Inspector may conduct a follow-up inspection after the expiration of the three (3) calendar day period within five (5) business days following the verbal meeting or review of photo documentation. If a follow-up inspection occurs, the GEC Inspector will document whether or not the prohibited activity has ceased, the deficiency has been corrected, or the property has been remediated.
8. If the Permittee fails to send appropriate documentation or continues to fail to cease the prohibited activity, correct the violations, and/or remediate the property, the GEC Inspector will issue a written Stop Work Order (SWO) notifying the Permittee that the violations are persisting and that the GEC Permit is temporarily rescinded. No work on the permitted site shall be conducted, with the exception of specific activities as listed in the SWO. A SWO on an Associate GEC Permit affects all lots owned by the Associate GEC Permittee within the boundaries of the original GEC Permit. The SWO shall remain in effect from the time of issuance until the violations are corrected and/or remediated, and the GEC Permit is reinstated.
9. After the violations have been corrected and the GEC Permit Reinstatement Fee is collected (refer to the Stormwater Enterprise GEC Permit Fee Schedule on the City website), the Permittee shall contact the GEC Inspector, who will conduct a follow-up inspection. The GEC Inspector will document whether or not the site is in compliance.
10. If the remediation is not completed, the City may issue a Notice and Order to Correct in accordance with City Code.
11. The City, in its discretion, may either remediate the condition itself, or contract out the remediation in accordance with City Code.
12. Any City-incurred remediation costs will be billed to the Permittee.

13. If the costs are not paid within fifteen (15) business days from service of the bill, the City reserves the right to take any legal action to recover the costs, including placing a lien on the violator's property.
14. If an illicit discharge occurs, the SWENT Manager may require, by written notice, that the responsible person or entity immediately, or by a specified date, discontinue the discharge, and, if necessary, take measures to eliminate the source of the discharge to prevent future occurrences. Additional information on illicit discharges can be found on the City website.
15. If the Permittee receives two (2) or more Letters of Non-Compliance within a rolling six (6) month period, or fails to stop the activity, correct the violations and/or remediate the property after a Letter of Non-Compliance is issued, or fails to remedy an illicit discharge after notice, a Stop Work Order will be issued by the SWENT Manager or their designee.
16. Depending on the severity, egregiousness, magnitude and frequency of the violations, the above and below listed processes and components may be escalated, bypassed and/or the inspection frequency increased. If a site meets the requirements for a GEC or Associate GEC Permit, and construction activity occurs without a permit in place, a Stop Work Order will be issued immediately. If the violator had an approved GEC Plan without an active GEC or Associate GEC Permit, the GEC or Associate GEC Permit Fee will be doubled. If the violator had neither an approved GEC Plan nor an active GEC or Associate GEC Permit, the GEC or Associate GEC Permit Fee will be tripled. The following additional components of the City's Enforcement Policies shall be reviewed, considered, and implemented as needed on a case by case basis:
 - Revocation of the GEC or Associate GEC Permit.
 - Referring of the matter to the City Attorney's Office – Prosecution Division for a determination to issue a summons into the Municipal Court.
 - Revocation of fiscal assurances and/or bonds.

If any of these additional components are implemented, the City will notify the Permittee, and in the case of the issuance of a summons into Municipal Court will issue the summons.

4.5.3 Enforcement on Non-Permitted Sites

The following are the escalation guidelines for violations involving non-permitted sites:

1. Upon notification or discovery that a violation has occurred, the GEC Inspector will, within three (3) calendar days proceed to inspect the site and investigate. The investigation will entail determining whether a violation has occurred, and the identity of the violator.

2. If no violation has occurred, the GEC Inspector will document the complaint, the substance of the investigation and why no violation occurred.
3. If a violation is determined to have occurred, the identity of the violator will be investigated. If the identity of the violator cannot be determined, the GEC Inspector will document the efforts made to make the identification. If the identity of the violator is determined, the GEC Inspector will document how that identity was determined.
4. Once a violation has been determined to have been committed and the violator identified, the GEC Inspector will promptly contact the violator.
5. If a GEC or Associate GEC Permit is required, the escalation guidelines for permitted sites shall be enforced, and a Stop Work Order will be issued immediately. The violator will be required to remediate the property to its prior condition as much as possible, install Construction Control Measures if necessary, and will be informed of the possible penalties. The violator must obtain a GEC or Associate GEC Permit prior to resuming work. If the violator had an approved GEC Plan without an active permit, the GEC or Associate GEC Permit Fee will be doubled. If the violator had neither an approved GEC Plan nor an active permit, the GEC or Associate GEC Permit Fee will be tripled.
6. If neither a GEC nor an Associate GEC Permit is required, the violator will be informed of the violation, requested to cease and desist from engaging in the prohibited activity, required to remediate the property to its prior condition to the maximum extent practicable, install Construction Control Measures if necessary, and/or informed of the possible penalties. The violator shall be given three (3) calendar days to remediate a property.
7. The GEC Inspector will document the date and substance of the conversation, including any statements made by the violator.
8. The GEC Inspector will conduct a follow-up inspection after the expiration of the three (3) calendar day period, but no later than five (5) business days following the verbal meeting. The GEC Inspector will document whether or not the prohibited activity has ceased and/or the property remediated.
9. If the violator fails to cease the prohibited activity and/or remediate the property, the GEC Inspector will issue a written Stop Work Order notifying the violator that the violation is persisting, needs to be ceased and/or the property remediated within three (3) calendar days, and the possible escalation consequences.
10. The GEC Inspector will conduct a follow-up inspection after the expiration of the three (3) calendar day period within five (5) business days after the expiration of the period. The GEC Inspector will document

whether or not the prohibited activity has ceased, the deficiency has been corrected, or the property has been remediated.

11. If the remediation is not completed, the City, in its discretion, may either remediate the condition itself, or contract out the remediation in accordance with City Code.
12. Any City incurred remediation costs will be billed to the violator.
13. If the costs are not paid within fifteen (15) business days from service of the bill, the City reserves the right to take any legal action to recover the costs, including placing a lien on the violator's property.
14. If the violator fails to cease the prohibited activity and/or fails to remediate the property, the GEC Inspector will refer the matter to the City Attorney's Office – Prosecution Division for a determination whether a summons shall be issued into the Municipal Court.
15. Upon such determination, the City will issue the summons upon the violator.

CHAPTER 7

PERMIT CLOSEOUT

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1.0 PERMIT CLOSEOUT STEPS

The permit closeout process for all GEC and Associate GEC Permits, excluding Associate GEC Permits closed under the Sale of Residence to a Homeowner process, is as follows:

1. When vegetative cover has established in accordance with the requirements in Chapter 5, the Permittee initiates a request for a final inspection in the City's Electronic Permitting Management System.
2. The Permittee will then be contacted by a GEC Inspector to schedule the final inspection within 5 business days. Refer to Chapter 6 for more information.
3. City GEC Inspector performs a final inspection.
4. If the site passes the final inspection, the GEC Inspector indicates the final inspection has been passed in the City's Electronic Permitting Management System. This completes the permit closeout process. The Permittee may then request release of erosion control financial assurances.
5. If the site fails the final inspection, the Permittee must address the findings in the previous inspection report and initiate another request for a final inspection.

2.0 PERMIT CLOSEOUT DETAILS

Prior to requesting a final inspection, Permittees must ensure that the following requirements are met.

2.1 Acceptance of Vegetation

The GEC Inspector will review the site vegetation in accordance with the guidelines in Chapter 5.

2.2 Final Site Preparation

Permittees should do the following to prepare for a final inspection:

- Ensure all streets, sidewalks and flow lines are clean of sediment. Clean all drainage features, including inlets and storm drains.
- Remove all temporary Construction Control Measures. Any areas disturbed as a result of the Control Measure removal shall be adequately stabilized. Failure to complete the above items will result in financial assurances being held.
-

2.3 Permanent Control Measure Requirements

All required documentation for Permanent Control Measures must be accepted by the City prior to GEC or Associate GEC Permit closeout. Information on the required documentation is available on the City website.

2.4 Release of Financial Assurances

After the GEC Inspector completes the permit closeout process in the Electronic Permitting Management System, the Permittee is sent instructions for release of financial assurances. The erosion control financial assurances are then returned to the Permittee according to the procedures contained in the Engineering Criteria Manual.

3.0 SALE OF RESIDENCE TO HOMEOWNER

For residential construction only and similar to state requirements, when a residential lot has been conveyed to a homeowner and all criteria in items a through d, below, are met, coverage under the approved GEC or Associate GEC Permit is no longer required. However, the former permittee is required to leave Control Measures in good working order at the time of permit closure or amendment. The Associate GEC Permit may be closed, or a lot may be removed from an Associate GEC Permit, under the following circumstances:

- a. The lot has been sold to the homeowner(s) for private residential use.
- b. The lot is less than one acre of disturbed area.
- c. All construction activity conducted by the builder on the lot is completed.
- d. A certificate of occupancy (or equivalent) has been awarded to the homeowner.

The GEC or Associate GEC Permit must be amended to indicate that the lot is no longer covered by the appropriate permit, or the GEC or Associate GEC Permit has been closed. The GEC Administrator or Permittee must upload photographs depicting the condition of the remaining Control Measures for review by the GEC Inspector. The amendment or permit closure will occur in the City Electronic Permitting Management System.

Lots not meeting all of the above criteria require continued permit coverage.

APPENDIX A

GRADING AND EROSION CONTROL PLAN CHECKLIST

GRADING AND EROSION CONTROL PLAN CHECKLIST

The GEC Plan shall include the following as a minimum. When some sections are not applicable, include a statement to that effect.

1. General vicinity map – Show the relationship of the site to existing and planned roadways, jurisdictional boundaries, major creeks, and streams.
2. Subdivision / Project name – The subdivision name as it appears on the Final Subdivision Plat. For projects not associated with a subdivision, include the project name.
3. Standard GEC Plan notes – See Appendix C.
4. Cost estimate of the Construction Control Measures including seeding and all installation and maintenance until final stabilization is achieved. A minimum of 40% of the total cost shall be added to the cost estimate for maintenance. A unit price list may be obtained from the Stormwater Enterprise. Cost estimates are not required for capital projects.
5. Signature blocks – See Appendix D. Contractor signature is not required prior to GEC Plan approval.
6. North arrow and bar scale
7. Plan view – at a scale of 1-inch to 20-feet up to 1-inch to 50-feet.
8. Property lines for the site on which the work will be performed.
9. Areas of land disturbance – total area of the site where any construction activity is expected to result in land disturbance of the ground surface.
10. Construction site boundaries – delineation of construction site boundaries.
11. Existing topography at one or two foot contour intervals. The map should extend a minimum of 10-feet beyond the property line for private development projects or beyond the project's land disturbance limits, whichever is larger.
12. Proposed topography at one or two foot contour intervals. The map should show elevations and extent and the slope of all proposed grading.
13. Location of any proposed features and structures on the site, including paved areas, retaining walls (including top and bottom of wall elevations), etc.

14. Adjacent existing and proposed development affected by the construction. Labels must include ownership information and address or tax schedule numbers.
15. Location of soil stockpiles – Areas designated for topsoil and subsoil storage must be shown on the plan, or a note must be included indicating that stockpile location will be determined by the contractor. Stockpile locations to be determined by contractor must not result in additional land disturbance.
16. Location of no-build areas if indicated in a geologic hazard study.
17. Location of existing or proposed water courses – to include, but not limited to, groundwater springs, streams, wetlands, or other surface waters, including areas where the COR400000 requires that pre-existing vegetation be maintained within 50 feet of a receiving water.
18. Location of existing or proposed drainage features on and adjacent to the site.
19. Location of Construction Control Measures and Permanent Control Measures to be constructed as a part of the proposed work. Construction Control Measures must be indicated using clear symbology and labels including abbreviations that match the Construction Control Measure detail sheets.
20. Location of concrete washout areas – Areas designated for concrete washout must be shown on the plan, or a note must be included indicating that concrete washout location will be determined by the contractor.
21. Location of staging areas – Staging area must be shown on the plan, or a note must be included indicating that staging area location will be determined by the contractor.
22. Vegetation – existing vegetation to remain and proposed seeding areas. A note referencing the Landscaping Plan must be included on the GEC Plan if proposed vegetation will not be shown.
23. Location of any asphalt, concrete batch plants, and masonry mix stations, if applicable.
24. Boundaries of the 100-yr floodplain, if applicable.
25. Boundaries of the City Streamside Overlay, if applicable. Overlays do not need to be shown for capital projects.
26. Boundaries of the City Hillside Overlay, if applicable. Overlays do not need to be shown for capital projects.
27. Existing utility locations and easements - grading over existing utilities or within dedicated easements is restricted. Contact Colorado Springs Utilities or easement owner for additional information.

28. Locations of preservation easements, if applicable.
29. Detail drawings of Construction Control Measures including installation and maintenance requirements. Details must match those provided in Appendix E, or be approved through the alternative Construction Control Measure approval process.
30. Anticipated starting and completion time period of land disturbance.
31. Expected date on which the final stabilization will be completed.
32. Receiving Waters – Name of closest named receiving waters.
33. Flow arrows that depict stormwater flow directions. Arrows do not need to be located within the limits of the proposed grading if visibility is compromised by their inclusion.
34. Locations of all non-structural Control Measures. Nonstructural controls (like street sweeping) without a specific location may be described using notes.

APPENDIX B

CSWMP CHECKLIST



CSWMP CHECKLIST

The CSWMP shall include the following items. When some sections are not applicable, include a statement to that effect.

1. Name, Address, Phone Number of the Permittee, GEC Administrator, and preparing engineer if applicable.
2. Subdivision / Project name – The subdivision name as it appears on the Final Subdivision Plat. For projects not associated with a subdivision, include the project name.
3. Signature Blocks – See Appendix D.
4. Adjacent Areas – A description of neighboring areas such as streams, residential areas, roads, etc., which may be affected by the land disturbance.
5. Construction Phasing – Sites with land disturbance area greater than 30 acres must address construction phasing, including temporary stabilization methods for areas which will not be disturbed for 14 days at a time.
6. Soils – A brief description of the soils on the site including information on soil type and character.
7. Soil Borings/Tests and Groundwater – Summary of soil borings and tests, including groundwater analysis and plan for safe discharge must be included if appropriate.
8. Self-Inspections – A description of procedures and a schedule of regular inspections during construction for vegetation, erosion and sediment Control Measure repair, and other protective measures identified in the plan. Refer to Chapter 6, Section 2.2 for specific self-inspection requirements.
9. GEC Administrator Certification – Include certificate of completion for City-sponsored Stormwater Management and Erosion Control During Construction class or approved equivalent.
10. All of the items required by Section I.C.2 of [Colorado Department of Public Health and Environment Construction General Permit COR400000](#) ("SWMP Contents"). These include:
 - a. Designation of a Qualified Stormwater Manager, who can be the same as the GEC Administrator.
 - b. Spill Prevention and Response Plan. (City reviews for inclusion only)

- c. **Materials Handling.** The CSWMP must describe all Control Measures implemented at the site to minimize impacts from handling significant materials that could contribute pollutants to runoff. These handling procedures can include Control Measures for pollutants and activities such as exposed storage of building materials, paints and solvents, landscape materials, fertilizers or chemicals, sanitary waste material, trash and equipment maintenance or fueling procedures. (City reviews for inclusion only)
- d. **Potential Sources of Pollution.** The CSWMP must list all potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges associated with construction activity from the site. This shall include, but is not limited to, the following pollutant sources as applicable:
 - i. Disturbed and stored soils;
 - ii. Vehicle tracking of sediments;
 - iii. Management of contaminated soils; (City reviews for inclusion only)
 - iv. Loading and unloading operations; (City reviews for inclusion only)
 - v. Outdoor storage activities (erodible building materials, fertilizers, chemicals, etc.); (City reviews for inclusion only)
 - vi. Vehicle and equipment maintenance and fueling; (City reviews for inclusion only)
 - vii. Significant dust or particulate generating processes (e.g., saw cutting material, including dust); (City reviews for inclusion only)
 - viii. Routine maintenance activities involving fertilizers, pesticides, herbicides, detergents, fuels, solvents, oils, etc.; (City reviews for inclusion only)
 - ix. On-site waste management practices (waste piles, liquid wastes, dumpsters); (City reviews for inclusion only)
 - x. Concrete truck/equipment washing, including washing of the concrete truck chute and associated fixtures and equipment; (City reviews for inclusion only)
 - xi. Dedicated asphalt, concrete batch plants and masonry mixing stations;
 - xii. Non-industrial waste sources such as worker trash and portable toilets.

- e. Implementation of Control Measures. The CSWMP must include design specifications that contain information on the implementation of the Control Measure in accordance with good engineering hydrologic and pollution control practices; including as applicable drawings, dimensions, installation information, materials, implementation processes, Control Measure-specific inspection expectations, and maintenance requirements. (City reviews for inclusion only)
- f. The CSWMP must include a documented use agreement between the applicable construction site owner or operator and the owner or operator of any Control Measures located outside of the construction site boundaries that are used by the applicable construction site for compliance with the GEC Plan, but not under the direct control of the applicable construction site owner or operator. The applicable construction site owner or operator is responsible for ensuring that all Control Measures located outside of the construction site boundaries, that are being used by the applicable construction site, are properly maintained and in compliance with all terms and conditions of Part I.B.3. The CSWMP must include all information required of and relevant to any such Control Measures located outside the construction site boundaries, including location, installation specifications, design specifications and maintenance requirements. (City reviews for inclusion only)
- g. Site Description to include, at a minimum, the following:
 - i. The nature of the construction activity at the site;
 - ii. The proposed schedule for the sequence for major construction activities and the planned implementation of Control Measures for each phase. (e.g.: clearing, grading, utilities, vertical, etc.);
 - iii. Estimates of the total acreage of the site, and the acreage expected to be disturbed by clearing, excavation, grading, or any other construction activities;
 - iv. A summary of any existing data used in the development of the construction site plans or CSWMP that describe the soil or existing potential for soil erosion; (City reviews for inclusion only);
 - v. A description of the percent of existing vegetative ground cover relative to the entire site and the method for determining the percentage; (City reviews for inclusion only);
 - vi. A description of any allowable non-stormwater discharges at the site, including those being discharged under the applicable low risk discharge guidance policy; (City reviews for inclusion only);

- vii. A description of areas receiving discharge from the site. Including a description of the immediate source receiving the discharge. If the stormwater discharge is to a municipal separate storm sewer system, the name of the entity owning that system, the location of the storm sewer discharge, and the ultimate receiving water(s); (City reviews for inclusion only); and
- viii. A description of all stream crossings located within the construction site boundary.
- h. Final Stabilization and Long Term Stormwater Management. The CSWMP must describe the practices used to achieve final stabilization of all disturbed areas at the site and any planned practices to control pollutants in stormwater discharges that will occur after construction operations are completed. This shall include, but is not limited to, Permanent Control Measures, etc. A reference to specifications and/or the site Landscaping Plan may fulfill this requirement, if applicable.

It is the Permittee's responsibility to ensure the most recent State SWMP requirements are being followed. Please note that the State SWMP requirements are subject to change without notice.

APPENDIX C

STANDARD GEC PLAN NOTES



STANDARD GEC PLAN NOTES

The nineteen (19) plan notes below shall be included on the GEC Plan.

1. No clearing, grading, excavation, or other land disturbing activities shall be allowed (except for work directly related to the installation of Initial Control Measures) until a City GEC Permit has been issued.
2. All land disturbing activities must be performed in accordance with and the approved GEC Plan and CSWMP.
3. Initial Control Measures shall be installed and inspected prior to any land disturbance activities taking place. An initial site inspection will not be scheduled until a City GEC Permit has been "conditionally approved." Call City Stormwater Inspections, 385-5980, at least 48 hours prior to construction to schedule an initial inspection and obtain full permit approval.
4. Individuals shall comply with the "Colorado Water Quality Control Act" (Title 25, Article 8, CRS) and the "Clean Water Act" (33 USC 1344), including regulations promulgated and certifications or permits issued, in addition to the requirements included in the City's MS4 Permit, Stormwater Construction Manual. In the event of conflicts between these requirements and water quality control laws, rules, or regulations of other Federal or State agencies, the more restrictive laws, rules, or regulations shall apply.
5. Stormwater discharges from construction sites shall not cause or threaten to cause pollution, contamination, or degradation of State Waters.
6. All Construction Control Measures shall be maintained until permanent stabilization measures are implemented. Temporary Construction Control Measures must be removed prior to permit closeout.
7. Concrete wash water shall not be discharged to or allowed to runoff to State Waters or any surface or subsurface storm drainage system or facilities.
8. Building, construction, excavation, or other waste materials shall not be temporarily placed or stored in the street, alley, or other public way, unless in accordance with an approved Traffic Control Plan. Construction Control Measures may be required by the GEC Inspector if deemed necessary based on specific conditions and circumstances (e.g., estimated time of exposure, season of the year, etc.).
9. All wastes composed of building materials must be removed from the construction site for disposal in accordance with local and state regulatory requirements. No building material wastes or unused building materials shall be buried, dumped, or discharged at the site.

10. The permittee shall be responsible for the removal of all construction debris, dirt, trash, rock, sediment, and sand that may accumulate in the storm sewer or other drainage conveyance system as a result of construction activities.
11. The quantity of materials stored on the project site shall be limited, as much as practical, to that quantity required to perform the work in an orderly sequence. All materials stored on-site shall be stored in a neat, orderly manner, in their original containers, with original manufacturer's labels. Materials shall not be stored in a location where they may be carried by stormwater runoff into the storm sewer system at any time.
12. Spill prevention and containment measures shall be used at all storage, equipment fueling, and equipment servicing areas so as to contain all spills and prevent any spilled material from entering the MS4, including any surface or subsurface storm drainage system or facility. Bulk storage structures for petroleum products and other chemicals shall have secondary containment or equivalent adequate protection. All spills shall be cleaned up immediately after discovery, or contained until appropriate cleanup methods can be employed. Manufacturer's recommended methods for spill cleanup shall be followed, along with proper disposal methods.
13. Sediment (mud and dirt) transported onto a public road, regardless of the size of the site, shall be cleaned as soon as possible after discovery.
14. No chemicals are to be added to the discharge unless permission for the use of a specific chemical is granted by the State. In granting the use of such chemicals, special conditions and monitoring may be required.
15. Control Measures for all slopes, channels, ditches, or any disturbed land area shall be completed within fourteen (14) calendar days after final grading or final land disturbance has been completed. Disturbed areas which are not at final grade but will remain dormant for longer than fourteen (14) days shall be roughened, mulched, tackified, or stabilized with tarps within fourteen (14) days after interim grading. An area that is going to remain in an interim state for more than sixty (60) days shall also be seeded, unless an alternative stabilization measure is accepted at the inspector's discretion. All temporary Construction Control Measures shall be maintained until final stabilization is achieved.
16. The GEC Plan will be subject to re-review and re-acceptance by the Stormwater Enterprise should any of the following occur: grading does not commence within twelve (12) months of the City's acceptance of the plan, the construction site is idle for twelve (12) consecutive months, a change in property ownership occurs, the planned development changes, or any other major modifications are proposed as defined in the Stormwater Construction Manual.

17. It is not permissible for any person to modify the grade of the earth on any utility easement or utility right-of-way without written approval from the utility owner. City acceptance of the GEC Plan and CSWMP does not satisfy this requirement. The plan shall not increase or divert water towards utility facilities. Any changes to existing utility facilities to accommodate the plan must be approved by the affected utility owner prior to implementing the plan. The cost to relocate or protect existing utilities or to provide interim access shall be at the applicant's expense.
18. Applicant represents and warrants that they have the legal authority to grade and/or construct improvements on adjacent property. The City has not reviewed the developer's authority to modify adjacent property. An approved GEC Permit does not provide approval for the Applicant to perform work on adjacent property.

Additional notes may be required by the review engineer. For example, the following note is required for all development projects, but is normally not required for capital projects:

"All utility installations within the limits of disturbance shown on this plan are covered under this plan. Locations of utilities within the limits of disturbance may be modified after plan approval as a field change. Utility installations related to the private development that extend beyond the limits of disturbance shown on this plan are considered to be part of the larger development, and therefore require a plan modification or separate plan for the additional disturbance area."

APPENDIX D

GEC PLAN / CSWMP SIGNATURE BLOCKS

1.0 Private Development Signature Blocks D-1

2.0 Capital Improvement Projects External Consultant Signature Blocks..... D-2

3.0 Capital Improvement Projects City Employee Signature Blocks D-4

4.0 Colorado Springs Utilities External Consultant Signature Blocks D-6

5.0 Colorado Springs Utilities Internal Employee Signature Blocks..... D-8

6.0 Airport Enterprise Signature Blocks..... D-9

1.0 PRIVATE DEVELOPMENT SIGNATURE BLOCKS

The engineer, owner, and review signature blocks are required on all GEC Plans for private development. The contractor, owner, and review signature blocks are required on all private development CSWMPs prepared by a contractor. The engineer, contractor, owner, and review signature blocks are required on all private development CSWMPs prepared by an engineer.

Engineer's Statement

This {Grading and Erosion Control Plan or CSWMP} was prepared under my direction and supervision and is correct to the best of my knowledge and belief. If such work is performed in accordance with the {Grading and Erosion Control Plan or CSWMP}, the work will not become a hazard to life and limb, endanger property, or adversely affect the safety, use, or stability of a public way, drainage channel, or other property.

Printed Name: _____ Date: _____

Phone Number: _____

Seal

Contractor's Statement

I will comply with the requirements of the Grading and Erosion Control Plan/CSWMP including Construction Control Measure inspection requirements and final stabilization requirements. I acknowledge the responsibility to determine whether the construction activities on these plans require Colorado Discharge Permit System (CDPS) permitting for stormwater discharges associated with construction activity.

Name of Contractor: _____

Authorized Signature: _____ Date: _____

Title: _____

Phone Number: _____

Address: _____

Email Address: _____

Owner's Statement

The owner will comply with the requirements of the {Grading and Erosion Control Plan or City Stormwater Management Plan} including Construction Control Measure inspection requirements and final stabilization requirements according to the City of Colorado Springs Stormwater Construction Manual. I acknowledge the responsibility to determine whether the construction activities on these plans require Colorado Discharge Permit System (CDPS) permitting for stormwater discharges associated with construction activity.

Owner Signature: _____ Date: _____

Name of Owner: _____ Phone: _____

Title: _____ Email: _____

City of Colorado Springs Grading and Erosion Control Review

This {Grading and Erosion Control Plan or CSWMP} is filed in accordance with City Code. This plan is reviewed in accordance with the Stormwater Construction Manual; latest revisions.

_____ Date: _____

For the SWENT Manager

Notes: _____

2.0 CAPITAL IMPROVEMENT PROJECTS EXTERNAL CONSULTANT SIGNATURE BLOCKS

The engineer, project manager, and review signature blocks are required on all Capital Improvement Projects GEC Plans prepared by an external consultant. The contractor, project manager, and review signature blocks are required on all Capital Improvement Projects CSWMPs prepared by a contractor. The engineer, contractor, project manager, and review signature blocks are required on all Capital Improvement Projects CSWMPs prepared by an engineer.

Engineer's Statement

This {Grading and Erosion Control Plan or CSWMP} was prepared under my direction and supervision and is correct to the best of my knowledge and belief. If such work is performed in accordance with the {Grading and Erosion Control Plan or CSWMP}, the work will not become a hazard to life and limb, endanger property, or adversely affect the safety, use, or stability of a public way, drainage channel, or other property.

Printed Name: _____ Date: _____

Phone Number: _____

Seal

Contractor's Statement

I will comply with the requirements of the Grading and Erosion Control Plan/CSWMP including Construction Control Measure inspection requirements and final stabilization requirements. I acknowledge the responsibility to determine whether the construction activities on these plans require Colorado Discharge Permit System (CDPS) permitting for stormwater discharges associated with construction activity.

Name of Contractor: _____

Authorized Signature: _____ Date: _____

Title: _____

Phone Number: _____

Address: _____

Email Address: _____

City Project Manager's Statement

I hereby certify that the drainage, grading, and erosion control for {Name of Project} shall be constructed according to the design presented in this {Grading and Erosion Control Plan or CSWMP}. I further understand that field changes must be reviewed by the SWENT Review Engineer to ensure conformance with the original design intent. I am employed by and perform engineering services solely for the City of Colorado Springs, and therefore am exempt from Colorado Revised Statute Title 12, Article 25, Part 1 according to § 12-25-103(1), C.R.S.

Name of City Project Manager: _____

Signature: _____ Date: _____

City of Colorado Springs Grading and Erosion Control Review

This {Grading and Erosion Control Plan or CSWMP} is filed in accordance with City Code. This plan is reviewed in accordance with the Stormwater Construction Manual; latest revisions.

_____ Date: _____

For the SWENT Manager

Notes: _____

3.0 CAPITAL IMPROVEMENT PROJECTS CITY EMPLOYEE SIGNATURE BLOCKS

The project manager and review signature blocks are required on all Capital Improvement Projects GEC Plans prepared by a City employee. The contractor, project manager, and review signature blocks are required on all Capital Improvement Projects CSWMPs prepared by a City employee.

Contractor's Statement

I will comply with the requirements of the Grading and Erosion Control Plan/CSWMP including Construction Control Measure inspection requirements and final stabilization requirements. I acknowledge the responsibility to determine whether the construction activities on these plans require Colorado Discharge Permit System (CDPS) permitting for stormwater discharges associated with construction activity.

Name of Contractor: _____

Authorized Signature: _____ Date: _____

Title: _____

Phone Number: _____

Address: _____

Email Address: _____

City Project Manager's Statement

I hereby certify that the drainage, grading, and erosion control for {Name of Project} shall be constructed according to the design presented in this {Grading and Erosion Control Plan or CSWMP}. I further understand that field changes must be reviewed by the SWENT Review Engineer to ensure conformance with the original design intent. I am employed by and perform engineering services solely for the City of Colorado Springs, and therefore am exempt from Colorado Revised Statute Title 12, Article 25, Part 1 according to § 12-25-103(1), C.R.S.

Name of City Project Manager: _____

Signature: _____ Date: _____

City of Colorado Springs Grading and Erosion Control Review

This {Grading and Erosion Control Plan or CSWMP} is filed in accordance with City Code. This plan is reviewed in accordance with the Stormwater Construction Manual; latest revisions.

_____ Date: _____

For the SWENT Manager

Notes: _____

4.0 COLORADO SPRINGS UTILITIES EXTERNAL CONSULTANT SIGNATURE BLOCKS

The engineer, project manager, and review signature blocks are required on all Colorado Springs Utilities GEC Plans prepared by an external consultant. The contractor, project manager, and review signature blocks are required on all Colorado Springs Utilities CSWMPs prepared by a contractor. The engineer, contractor, project manager, and review signature blocks are required on all Capital Improvement Projects CSWMPs prepared by an engineer.

Engineer's Statement

This {Grading and Erosion Control Plan or CSWMP} was prepared under my direction and supervision and is correct to the best of my knowledge and belief. If such work is performed in accordance with the {Grading and Erosion Control Plan or CSWMP}, the work will not become a hazard to life and limb, endanger property, or adversely affect the safety, use, or stability of a public way, drainage channel, or other property.

Printed Name: _____ Date: _____

Phone Number: _____

Seal

Contractor's Statement

I will comply with the requirements of the Grading and Erosion Control Plan/CSWMP including Construction Control Measure inspection requirements and final stabilization requirements. I acknowledge the responsibility to determine whether the construction activities on these plans require Colorado Discharge Permit System (CDPS) permitting for stormwater discharges associated with construction activity.

Name of Contractor: _____

Authorized Signature: _____ Date: _____

Title: _____

Phone Number: _____

Address: _____

Email Address: _____

CSU Project Manager's Statement

I hereby certify that the drainage, grading, and erosion control for {Name of Project} shall be constructed according to the design presented in this {Grading and Erosion Control Plan or CSWMP}. I further understand that field changes must be reviewed by the SWENT Review Engineer to ensure conformance with the original design intent. I am employed by and perform engineering services solely for Colorado Springs Utilities, an enterprise of the City of Colorado Springs, and therefore am exempt from Colorado Revised Statute Title 12, Article 25, Part 1 according to § 12-25-103(1), C.R.S.

Name of CSU Project Manager: _____

Signature: _____ Date: _____

Title: _____

Phone Number: _____

Email Address: _____

City of Colorado Springs Grading and Erosion Control Review

This {Grading and Erosion Control Plan or CSWMP} is filed in accordance with City Code. This plan is reviewed in accordance with the Stormwater Construction Manual; latest revisions.

_____ Date: _____

For the SWENT Manager

Notes: _____

5.0 COLORADO SPRINGS UTILITIES INTERNAL EMPLOYEE SIGNATURE BLOCKS

The project manager and review signature blocks are required on all Colorado Springs Utilities GEC Plans prepared by a CSU employee. The contractor, project manager, and review signature blocks are required on all Colorado Springs Utilities CSWMPs prepared by a CSU employee.

Contractor's Statement

I will comply with the requirements of the Grading and Erosion Control Plan/CSWMP including Construction Control Measure inspection requirements and final stabilization requirements. I acknowledge the responsibility to determine whether the construction activities on these plans require Colorado Discharge Permit System (CDPS) permitting for stormwater discharges associated with construction activity.

Name of Contractor: _____

Authorized Signature: _____ Date: _____

Title: _____

Phone Number: _____

Address: _____

Email Address: _____

CSU Project Manager's Statement

I hereby certify that the drainage, grading, and erosion control for {Name of Project} shall be constructed according to the design presented in this {Grading and Erosion Control Plan or CSWMP}. I further understand that field changes must be reviewed by the SWENT Review Engineer to ensure conformance with the original design intent. I am employed by and perform engineering services solely for Colorado Springs Utilities, an enterprise of the City of Colorado Springs, and therefore am exempt from Colorado Revised Statute Title 12, Article 25, Part 1 according to § 12-25-103(1), C.R.S.

Name of CSU Project Manager: _____

Signature: _____ Date: _____

Title: _____

Phone Number: _____

Email Address: _____

City of Colorado Springs Grading and Erosion Control Review

This {Grading and Erosion Control Plan or CSWMP} is filed in accordance with City Code. This plan is reviewed in accordance with the Stormwater Construction Manual; latest revisions.

_____ Date: _____

For the SWENT Manager

Notes: _____

6.0 AIRPORT ENTERPRISE SIGNATURE BLOCKS

The engineer, owner, and review signature blocks are required on all GEC Plans for Airport Enterprise development. The contractor, owner, and review signature blocks are required on all Airport Enterprise development CSWMPs prepared by a contractor. The engineer, contractor, owner, and review signature blocks are required on all Airport Enterprise development CSWMPs prepared by an engineer.

Engineer's Statement

This {Grading and Erosion Control Plan or CSWMP} was prepared under my direction and supervision and is correct to the best of my knowledge and belief. If such work is performed in accordance with the {Grading and Erosion Control Plan or CSWMP}, the work will not become a hazard to life and limb, endanger property, or adversely affect the safety, use, or stability of a public way, drainage channel, or other property.

Printed Name: _____ Date: _____

Phone Number: _____

Seal

Contractor's Statement

I will comply with the requirements of the Grading and Erosion Control Plan/CSWMP including Construction Control Measure inspection requirements and final stabilization requirements. I acknowledge the responsibility to determine whether the construction activities on these plans require Colorado Discharge Permit System (CDPS) permitting for stormwater discharges associated with construction activity.

Name of Contractor: _____

Authorized Signature: _____ Date: _____

Title: _____

Phone Number: _____

Address: _____

Email Address: _____

Airport Enterprise Fund Manager's Statement

The Airport Enterprise will comply with the requirements of the {Grading and Erosion Control Plan or CSWMP} including Construction Control Measure inspection requirements and final stabilization requirements according to the City of Colorado Springs Stormwater Construction Manual. I further understand that field changes must be reviewed by the SWENT Review Engineer to ensure conformance with the original design intent. I acknowledge the responsibility to determine whether the construction activities on these plans require Colorado Discharge Permit System (CDPS) permitting for stormwater discharges associated with construction activity.

Owner Signature: _____ Date: _____

Name of Owner: _____ Phone: _____

Title: _____ Email: _____

City of Colorado Springs Grading and Erosion Control Review

This {Grading and Erosion Control Plan or CSWMP} is filed in accordance with City Code. This plan is reviewed in accordance with the Stormwater Construction Manual; latest revisions.

_____ Date: _____

For the SWENT Manager

Notes: _____

APPENDIX E

CONSTRUCTION CONTROL MEASURE DETAILS

It is the Permittee's responsibility to comply with all specifications and details provided on the City of Colorado Springs website under standard drawings. The Permittee should check regularly for updates, as additional details may be posted.

CHECK DAM

CD



1.0 DESCRIPTION

- Check dams are small temporary rock dams constructed across a swale or drainage ditch.

2.0 PURPOSE

- Used to slow down the velocity of concentrated flow to limit erosion and to promote sedimentation.
- Placed in areas of concentrated flow, such as a ditch or swale.

3.0 IMPLEMENTATION

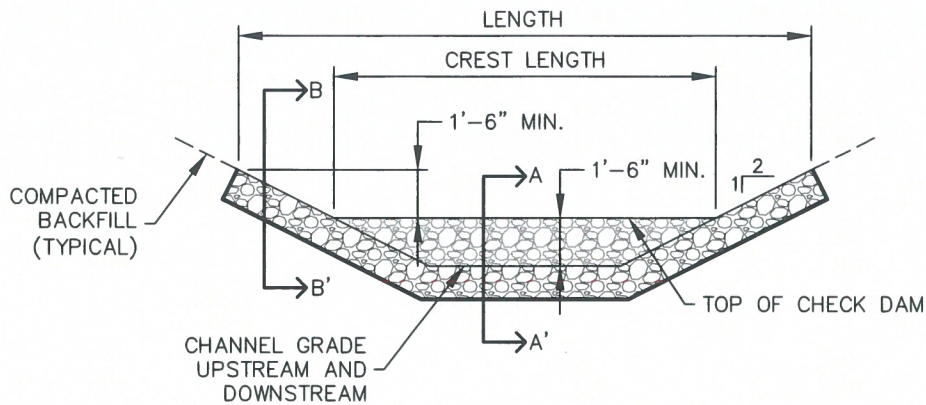
- Place check dams at regular intervals perpendicular to the direction of flow.
- Use check dams on mild or moderately steep slopes.
- Install wide enough check dams to reach from bank to bank of the ditch or swale.
- In general, the maximum spacing between check dams should be such that the toe of the upstream check dam is at the same elevation as the top of the downstream check dam.
- During installation, place rock mechanically or by hand.

4.0 TIMING

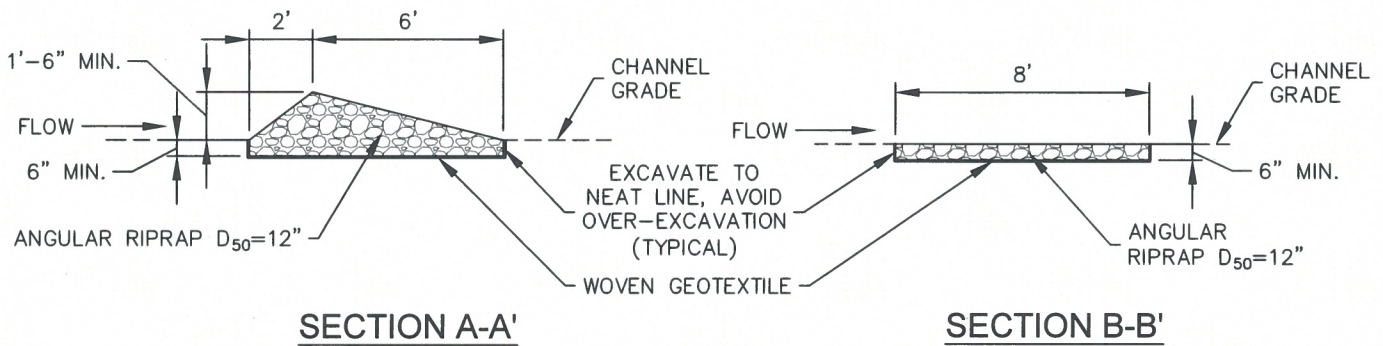
- Install prior to land disturbing activities.
- Remove after surrounding area has been permanently stabilized, or immediately prior to installation of a non-erodible lining. Permanently stabilize bare areas caused by check dams after removal.

5.0 MAINTENANCE

- Remove and properly dispose of sediment when it has accumulated to 1/2 of the height of the check dam crest.
- Replace missing rocks causing voids in the check dam.
- Inspect for erosion along the ends of check dams and repair when necessary.

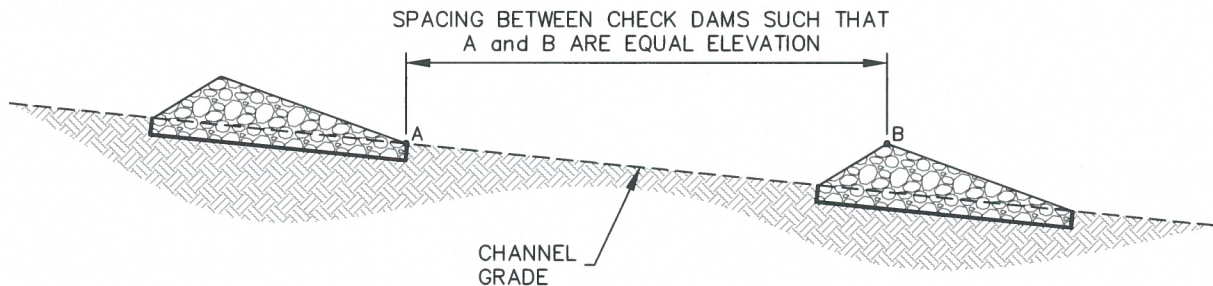


CHECK DAM ELEVATION VIEW



SECTION A-A'

SECTION B-B'



PROFILE

INSTALLATION NOTES

1. CHECK DAMS SHOULD BE INSTALLED BEFORE UPSTREAM LAND DISTURBING ACTIVITIES.
2. RIPRAP PAD SHOULD BE TRENCHED INTO GROUND BY A MINIMUM OF 6".

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES $\frac{1}{2}$ THE HEIGHT OF THE CHECK DAM CREST.
3. CHECK DAMS MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AFTER CHECK DAMS ARE REMOVED IF REMOVAL IS REQUIRED.

CD



CHECK DAM

APPROVED:

SWENT MANAGER

ISSUED:
10/7/19

REVISED:
8/19/2020

DRAWING NO.
900-CD

CULVERT INLET PROTECTION

CIP



1.0 DESCRIPTION

- Culvert inlet protection consists of a permeable sediment barrier installed upstream of a flared end section entrance to a culvert or storm sewer.

2.0 PURPOSE

- Used to prevent sediment and debris from entering a culvert or storm drainage system prior to permanent stabilization of the contributing disturbed area.
- Culvert inlet protection slows down runoff velocity to filter runoff and to promote sedimentation prior to entry into a culvert or storm drainage system.

3.0 IMPLEMENTATION

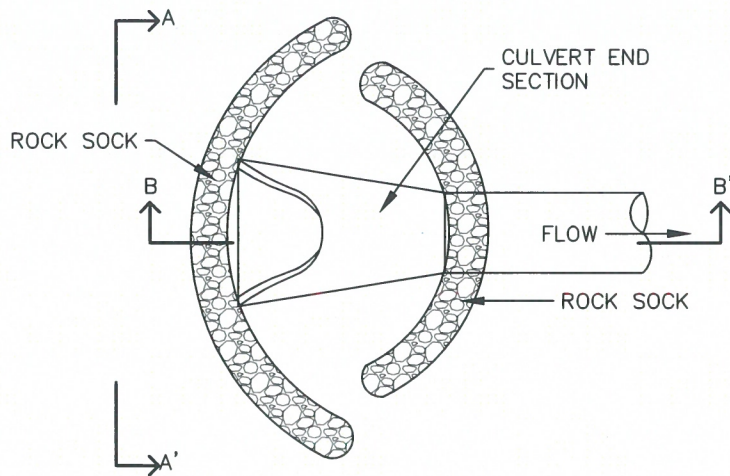
- Install culvert inlet protection at flared end section inlets to culverts and storm sewers that are operable and receiving runoff from disturbed areas during construction.
- Culvert inlet protection is not a stand-alone control measure and should be used in conjunction with other upgradient control measures. Culvert inlet protection with a contributing drainage area including of one acre or more of disturbed area must be part of a treatment train.

4.0 TIMING

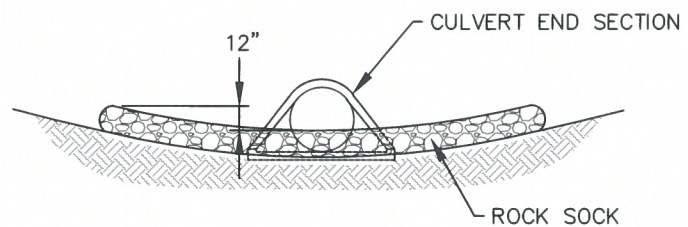
- Install prior to land disturbing activities, or immediately after pipe installation.
- Remove and properly dispose of culvert inlet protection after the contributing drainage area has been permanently stabilized.

5.0 MAINTENANCE

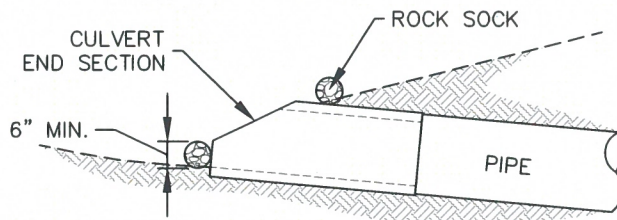
- Remove and properly dispose of sediment when it has accumulated to 1/2 of the height of the rock sock.
- Inspect for displaced rock socks that are no longer protecting the inlet.



CULVERT INLET PROTECTION PLAN



SECTION A-A'



SECTION B-B'

INSTALLATION NOTES

1. SEE ROCK SOCK DETAIL.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT UPSTREAM OF THE CULVERT SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS $\frac{1}{2}$ HEIGHT OF THE ROCK SOCK.
3. CULVERT INLET PROTECTION SHALL REMAIN UNTIL THE UPSTREAM AREA IS PERMANENTLY STABILIZED.



**CULVERT INLET
PROTECTION**

APPROVED:

SWENT MANAGER

ISSUED:
10/7/19

REVISED:
8/19/2020

DRAWING NO.
900-CIP

CONCRETE WASHOUT AREA

CWA



1.0 DESCRIPTION

- Concrete washout areas consist of either an excavated pit or a prefabricated haul-away container designed to contain concrete and concrete waste water.

2.0 PURPOSE

- Used to contain concrete and concrete waste water when the chutes of concrete mixers and hoppers of concrete pumps are rinsed out after delivery.
- Concrete washout areas consolidate solids for easier disposal and prevent runoff of concrete waste water, which is alkaline and contains high levels of chromium.

3.0 IMPLEMENTATION

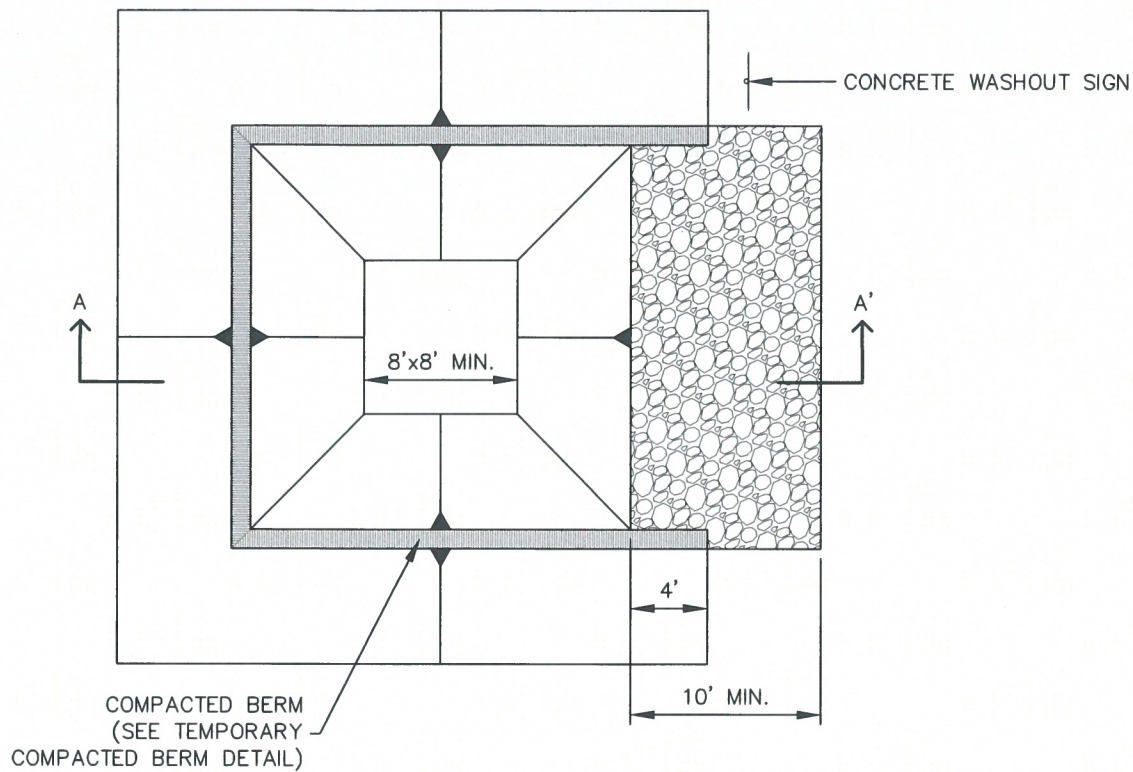
- Locate at least 50 feet away from State Waters, measured horizontally. Unlined concrete washout areas must be located at least 400 feet away from State Waters, and at least 1000 feet away from wells or drinking water sources.
- Do not locate in areas where shallow groundwater may be present, such as near natural drainages, springs, or wetlands.
- Do not place in areas subject to run-on.
- Label areas with appropriate signage.
- The addition of solvents, flocculents, or acid to wash water is prohibited.

4.0 TIMING

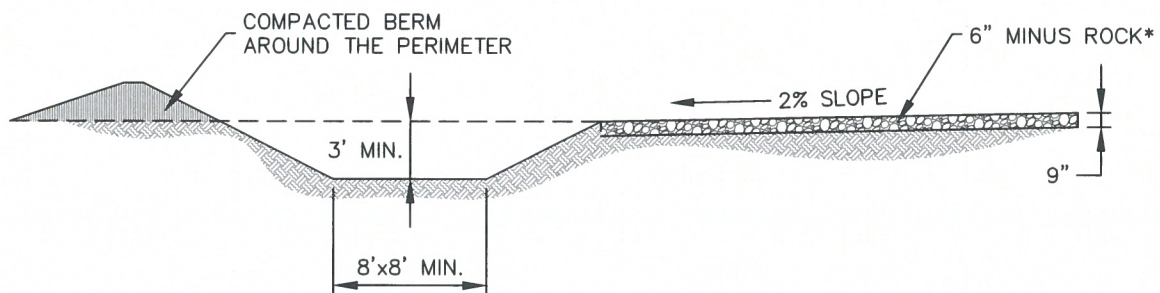
- Install prior to concrete activities.
- Remove after concrete activities have concluded.

5.0 MAINTENANCE

- Clean out facilities once they are 2/3 full, or construct new facilities for additional capacity.
- Concrete waste must be permanently disposed of off-site in an appropriate manner.



CONCRETE WASHOUT AREA PLAN



SECTION A-A'

*ROCK REQUIRED BASED ON
SITE CONDITIONS AT THE
DISCRETION OF THE GEC
INSPECTOR



**CONCRETE
WASHOUT AREA**

APPROVED:		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-CWA-1

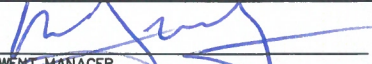
INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
-LOCATION OF CONCRETE WASHOUT AREA
2. LOCATE AT LEAST 50' AWAY FROM STATE WATERS MEASURED HORIZONTALLY.
3. AN IMPERMEABLE LINER (16 MIL. MINIMUM THICKNESS) IS REQUIRED IF CONCRETE WASH AREA IS LOCATED WITHIN 400' OF STATE WATERS OR 1000' OF WELLS OR DRINKING WATER SOURCES.
4. DO NOT LOCATE IN AREAS WHERE SHALLOW GROUNDWATER MAY BE PRESENT.
5. THE CONCRETE WASH AREA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.
6. CONCRETE WASH AREA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8'.
7. BERM SURROUNDING SIDES AND BACK OF CONCRETE WASH AREA SHALL HAVE A MINIMUM HEIGHT OF 2 FEET.
8. CONCRETE WASH AREA ENTRANCE SHALL BE SLOPED 2% TOWARDS THE CONCRETE WASH AREA.
9. SIGNS SHALL BE PLACED AT THE CONCRETE WASH AREA.
10. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. THE CONCRETE WASH AREA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS ACCUMULATED IN THE PIT SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF $\frac{2}{3}$ THE HEIGHT OF THE CONCRETE WASH AREA.
3. CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE, AND ALL OTHER DEBRIS IN THE SUBSURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER-TIGHT CONTAINER AND DISPOSED OF PROPERLY.
4. THE CONCRETE WASH AREA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.
5. PERMANENTLY STABILIZE AREA AFTER CONCRETE WASH AREA IS REMOVED.



	CONCRETE WASHOUT AREA		
	APPROVED: 		
	SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-CWA-2	

EROSION CONTROL BLANKET

ECB



1.0 DESCRIPTION

- Woven blankets made of natural and biodegradable materials placed on disturbed areas and secured to the ground with staples or stakes.

2.0 PURPOSE

- Used to control erosion, retain sediment resulting from sheet flow, and protect newly seeded areas.

3.0 IMPLEMENTATION

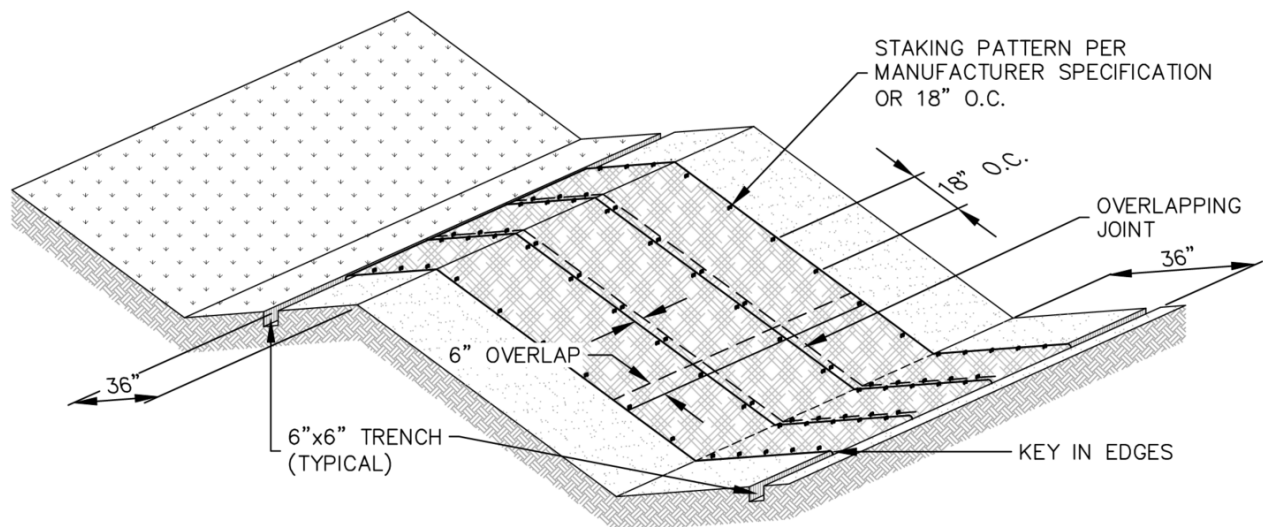
- Install erosion control blankets over uniform surfaces, with no large rocks, vegetation, or rills.
- Properly prepare topsoil and apply seed prior to blanket installation.
- Erosion control blankets must be made from 100% natural and biodegradable materials.
- Turf reinforcement mats may be used in place of erosion control blankets when specified by engineer.

4.0 TIMING

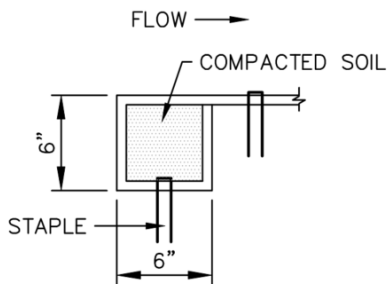
- Install in disturbed areas after final grading and seeding has been completed.
- Leave erosion control blankets in place to biodegrade, or remove if required by the GEC Inspector.

5.0 MAINTENANCE

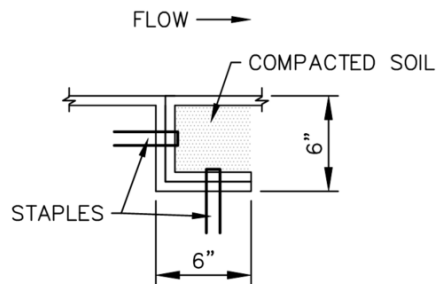
- Any erosion control blanket pulled out, torn, or otherwise damaged shall be repaired or reinstalled.
- Any subgrade areas below the geotextile that have eroded to create a void under the blanket, or that remain devoid of grass shall be repaired, reseeded and mulched and the erosion control blanket reinstalled.
- Broken or damaged staking must be repaired immediately when identified.



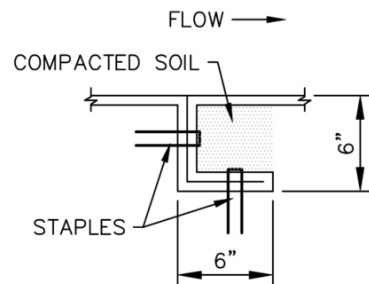
EROSION CONTROL BLANKET



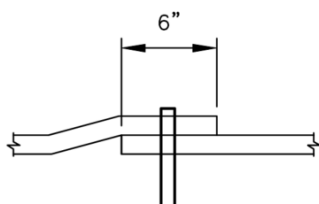
PERIMETER
ANCHOR TRENCH



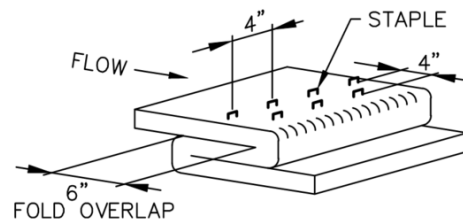
JOINT
ANCHOR TRENCH



INTERMEDIATE
CHECK SLOT



OVERLAPPING
JOINT



STAPLE CHECK
TO BE USED ON SLOPE EVERY 15 FEET



EROSION CONTROL BLANKET

APPROVED:
SWENT MANAGER

ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-ECB-1
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INSTALLATION NOTES

1. 100% NATURAL AND BIODEGRADABLE MATERIALS ARE REQUIRED FOR EROSION CONTROL BLANKETS. TRM PRODUCTS MAY BE USED WHERE APPROPRIATE AS DESIGNATED BY THE ENGINEER.
2. IN AREAS WHERE EROSION CONTROL BLANKETS ARE SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOIST PRIOR TO EROSION CONTROL BLANKET INSTALLATION, AND THE EROSION CONTROL BLANKET SHALL BE IN FULL CONTACT WITH THE SUBGRADE. NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.
3. PERIMETER ANCHOR TRENCH SHALL BE USED ALONG THE OUTSIDE PERIMETER OF ALL BLANKET AREAS.
4. JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF EROSION CONTROL BLANKETS TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL EROSION CONTROL BLANKETS.
5. INTERMEDIATE CHECK SLOT OR STAPLE CHECK SHALL BE INSTALLED EVERY 15' DOWN SLOPES. IN DRAINAGEWAYS, INSTALL CHECK SLOTS EVERY 25' PERPENDICULAR TO FLOW DIRECTION.
6. OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF EROSION CONTROL BLANKETS TOGETHER FOR EROSION CONTROL BLANKETS ON SLOPES.
7. MATERIAL SPECIFICATIONS OF EROSION CONTROL BLANKETS SHALL CONFORM TO TABLE ECB-1.
8. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING EROSION CONTROL BLANKETS SHALL BE RESEED AND MULCHED.
9. STRAW EROSION CONTROL BLANKETS SHALL NOT BE USED WITHIN STREAMS AND DRAINAGE CHANNELS.
10. COMPACT ALL TRENCHES.

MAINTENANCE NOTES

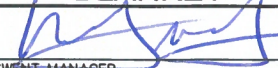
1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. EROSION CONTROL BLANKETS SHALL BE LEFT IN PLACE TO EVENTUALLY BIODEGRADE. TRM MUST BE REMOVED AT THE DISCRETION OF THE GEC INSPECTOR.
3. ANY EROSION CONTROL BLANKET PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE REPAIRED OR REINSTALLED. ANY SUBGRADE AREAS BELOW GEOTEXTILE THAT HAVE ERODED TO CREATE A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEED AND MULCHED AND THE EROSION CONTROL BLANKET REINSTALLED.

TABLE ECB-1, EROSION CONTROL BLANKET MATERIAL SPECIFICATIONS

TYPE	COCONUT CONTENT	STRAW CONTENT	EXCELSIOR CONTENT	RECOMMENDED NETTING
STRAW	—	100%	—	DOUBLE/NATURAL
STRAW-COCONUT	30% MIN.	70% MAX.	—	DOUBLE/NATURAL
COCONUT	100%	—	—	DOUBLE/NATURAL
EXCELSIOR	—	—	100%	DOUBLE/NATURAL



EROSION CONTROL BLANKET

APPROVED: 
SWENT MANAGER

ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-ECB-2
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INLET PROTECTION

IP



1.0 DESCRIPTION

- Inlet protection consists of a permeable sediment barrier installed around a storm inlet.

2.0 PURPOSE

- Used to minimize the amount of sediment and debris entering a storm drainage system prior to permanent stabilization of the contributing disturbed area.
- Inlet protection slows down runoff velocity to filter runoff and to promote sedimentation prior to entry into a storm drainage system.

3.0 IMPLEMENTATION

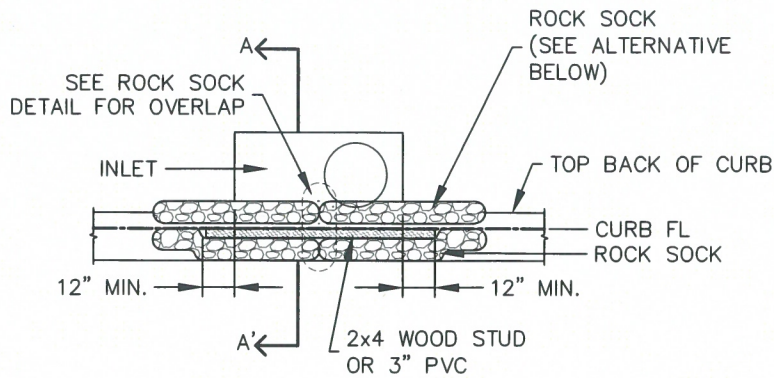
- Install inlet protection at storm sewer inlets that are operable and receiving runoff from disturbed areas during construction.
- Place inlet protection to allow the inlet to function without completely blocking flows into the inlet in a manner that causes localized flooding.
- Inlet protection is not a stand-alone control measure and should be used in conjunction with other upgradient control measures. Inlet protection in areas with a contributing drainage area of one acre or larger must be part of a treatment train.
- When selecting the type of inlet protection, consider factors such as type of inlet, traffic, anticipated flows, ability to secure the inlet protection, safety, and other site-specific conditions.

4.0 TIMING

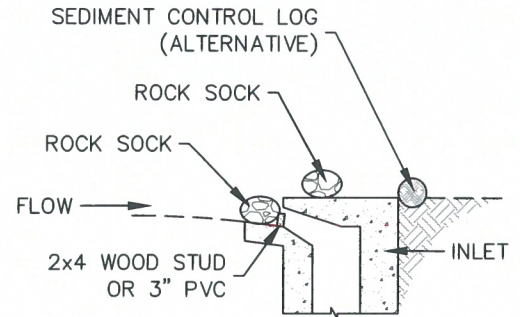
- Install prior to land disturbing activities, or immediately after inlet installation.
- Remove and properly dispose of inlet protection after the contributing drainage area has been permanently stabilized.

5.0 MAINTENANCE

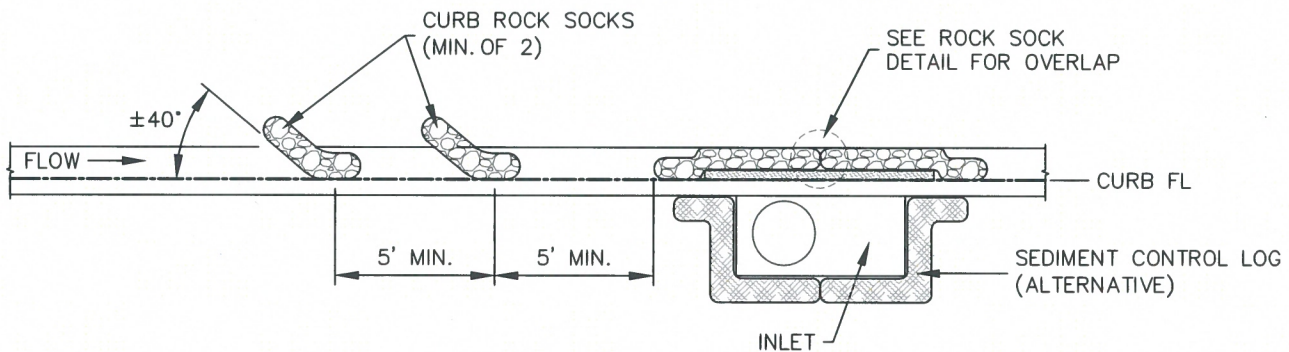
- Remove and properly dispose of sediment when it has accumulated to 1/2 of the design depth of the inlet barrier.
- Inspect for holes or tears that can result in sediment directly entering the inlet.
- Inspect for displaced inlet protection that is no longer protecting the inlet.



CURB INLET PROTECTION PLAN



SECTION A-A'



CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

INSTALLATION NOTES

1. SEE ROCK SOCK DETAIL FOR INSTALLATION REQUIREMENTS.
2. PLACEMENT OF THE ROCK SOCK SHALL BE APPROXIMATELY 40 DEGREES FROM THE CURB.
3. ROCK SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED A MINIMUM OF 5' APART.
4. AT LEAST TWO CURB ROCK SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON-GRADE INLETS.
5. ADDITIONAL ROCK SOCKS MAY BE REQUIRED AT GEC INSPECTOR'S DISCRETION.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES $\frac{1}{2}$ OF THE DESIGN DEPTH OF THE INLET BARRIER.
3. ROCK SOCKS MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA BEHIND INLET AFTER ROCK SOCKS ARE REMOVED WHEN REMOVAL IS APPROPRIATE.

IP-1



**ON-GRADE INLET
PROTECTION**

APPROVED:

SWENT MANAGER

ISSUED:

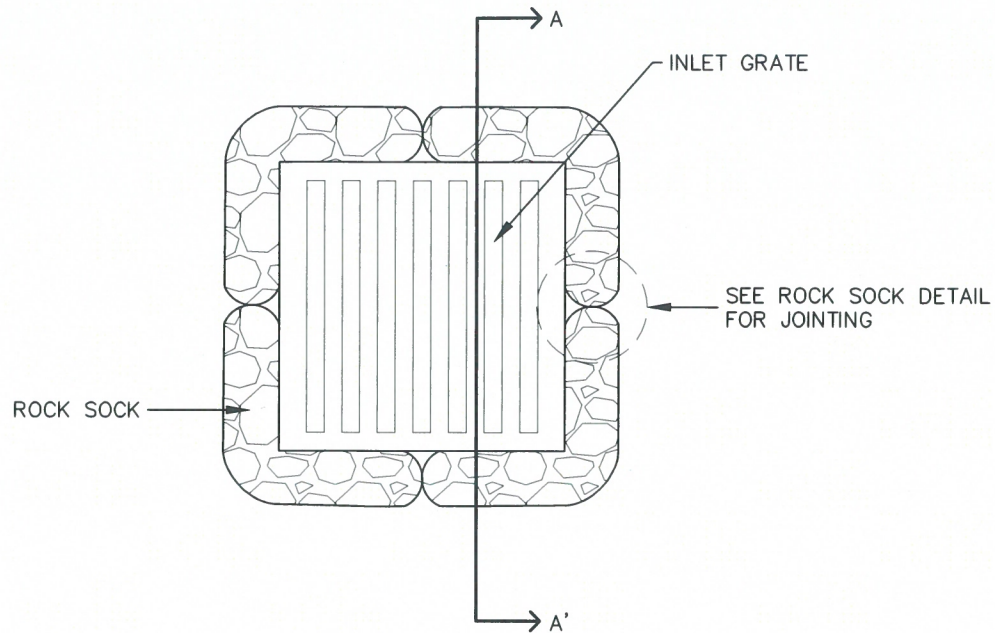
10/7/19

REVISED:

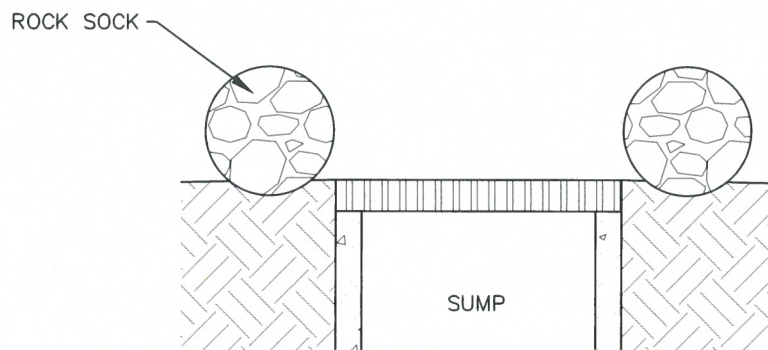
8/19/2020

DRAWING NO.

900-IP-1



ROCK SOCK SUMP INLET PROTECTION PLAN



SECTION A-A'

INSTALLATION NOTES

1. SEE ROCK SOCK DETAIL FOR INSTALLATION REQUIREMENTS.
2. SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS IN PVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL
3. CONTROL MEASURES MUST BE WRAPPED AROUND INLET AS TIGHTLY AS POSSIBLE.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES $\frac{1}{2}$ OF THE DESIGN DEPTH OF THE INLET BARRIER.
3. ROCK SOCKS MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AROUND INLET AFTER ROCK SOCKS ARE REMOVED WHEN REMOVAL IS APPROPRIATE.

IP-2



SUMP INLET PROTECTION

APPROVED:

SWENT MANAGER

ISSUED:

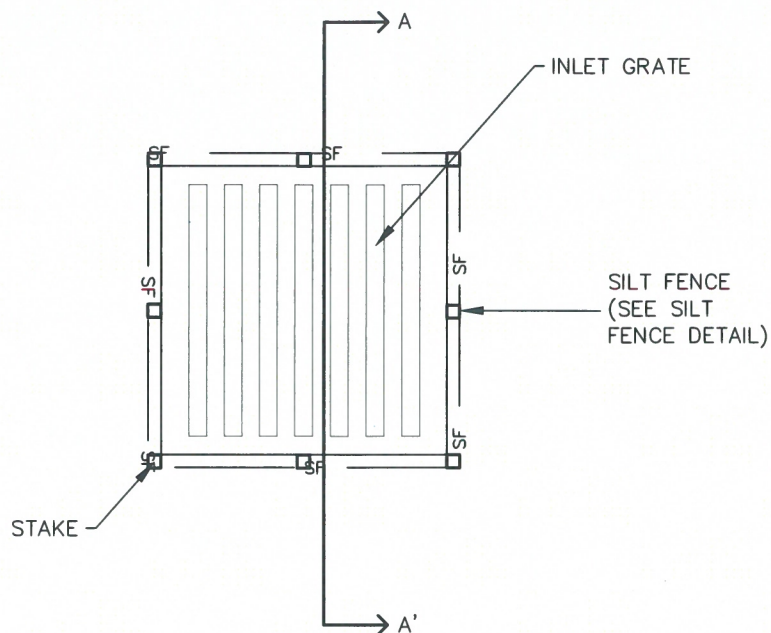
10/7/19

REVISED:

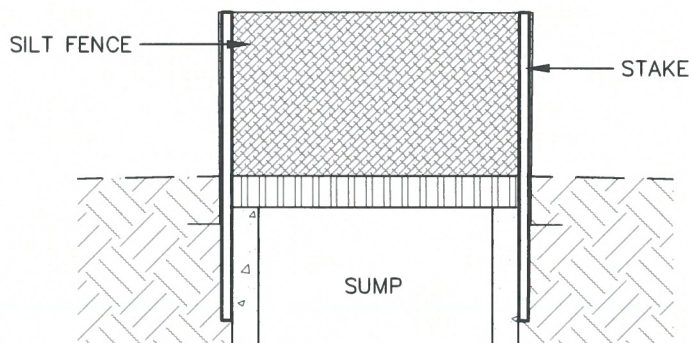
8/19/2020

DRAWING NO.

900-IP-2



SILT FENCE SUMP INLET PROTECTION PLAN



SECTION A-A'

INSTALLATION NOTES

1. SEE SILT FENCE DETAIL FOR INSTALLATION REQUIREMENTS.
2. POSTS SHALL BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF THREE FEET.
3. SILT FENCE FABRIC SHOULD HAVE A FLOW RATE IN EXCESS OF 30 GALLONS PER MINUTE PER SQUARE YARD SO AS TO ALLOW SOME WATER FLOW AND NOT DAM THE WATER. STANDARD, LOW-FLOW SILT FENCE FABRIC WILL NOT BE ALLOWED.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES $\frac{1}{2}$ OF THE DESIGN DEPTH OF THE INLET BARRIER.
3. SILT FENCE MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AROUND INLET AFTER SILT FENCE IS REMOVED WHEN REMOVAL IS APPROPRIATE.

IP-3



SUMP INLET PROTECTION

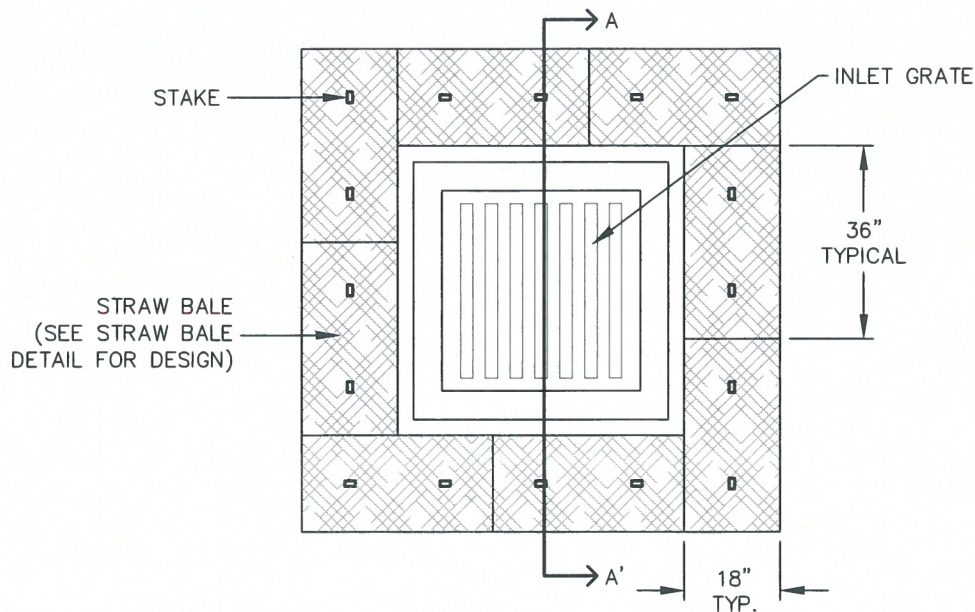
APPROVED:

SWENT MANAGER

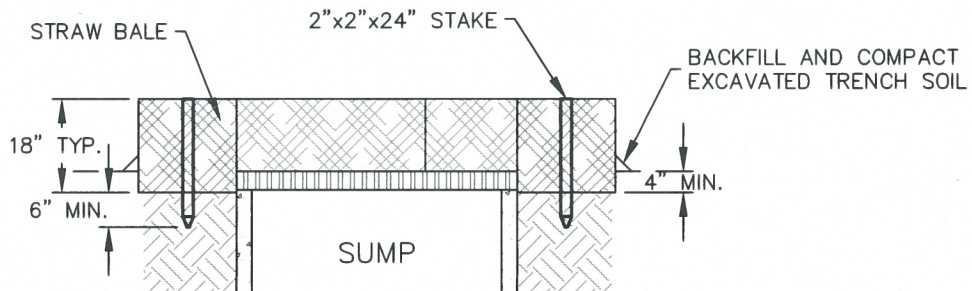
ISSUED:
10/7/19

REVISED:
8/19/2020

DRAWING NO.
900-IP-3



STRAW BALE SUMP INLET PROTECTION PLAN



SECTION A-A'

INSTALLATION NOTES

1. BALES SHALL BE PLACED IN A SINGLE ROW AROUND THE INLET WITH THE ENDS OF THE BALES TIGHTLY ABUTTING ONE ANOTHER.
2. STRAW BALES SHALL CONSIST OF CERTIFIED WEED FREE STRAW OR HAY. LOCAL JURISDICTIONS MAY REQUIRE PROOF THAT BALES ARE WEED FREE.
3. STRAW BALES SHALL CONSIST OF APPROXIMATELY 5 CUBIC FEET OF STRAW OR HAY AND WEIGH NOT LESS THAN 35 POUNDS.
4. STRAW BALE DIMENSIONS SHALL BE APPROXIMATELY 36"x18"x18".
5. A UNIFORM ANCHOR TRENCH SHALL BE EXCAVATED TO A DEPTH OF 4". STRAW BALES SHALL BE PAVED SO THAT THE BINDING TWINE IS ENCOMPASSING THE VERTICAL SIDES OF THE BALE(S).
6. TWO (2) WOODEN STAKES SHALL BE USED TO HOLD EACH BALE IN PLACE. WOODEN STAKES SHALL BE 2"x2"x24 (MIN.)". WOODEN STAKES SHALL BE DRIVEN A MINIMUM OF 6" INTO THE GROUND.

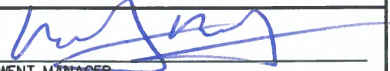
MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES $\frac{1}{2}$ OF THE DESIGN DEPTH OF THE INLET BARRIER.
3. STRAW BALES MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AROUND INLET AFTER STRAW BALES ARE REMOVED WHEN REMOVAL IS APPROPRIATE.
5. STRAW BALES SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, ROTTEN OR DAMAGED BEYOND REPAIR.

IP-4



SUMP INLET PROTECTION

APPROVED: 		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-IP-4

PORTABLE TOILET

PT



1.0 DESCRIPTION

- The portable toilet detail provides requirements for portable toilet use on construction sites.

2.0 PURPOSE

- Used to minimize the risk of pollutant migration to State Waters.

3.0 IMPLEMENTATION

- Place portable toilet a minimum of 10 feet from the back of curb or on a trailer for road projects or sites that are mostly paved.
- Anchor portable toilet to the ground, at a minimum of two opposing corners (on a diagonal) using U-shaped rebar stakes.

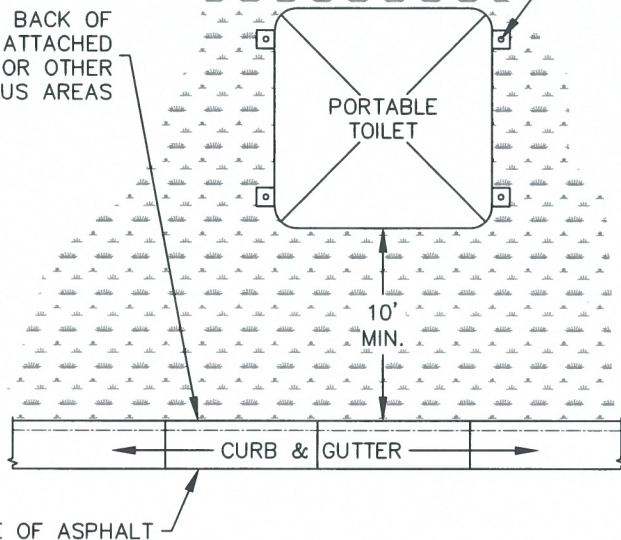
4.0 TIMING

- Install as needed.
- Remove prior to the end of construction. Permanently stabilize any disturbed areas associated with the installation, maintenance, and/or removal of the toilets.

5.0 MAINTENANCE

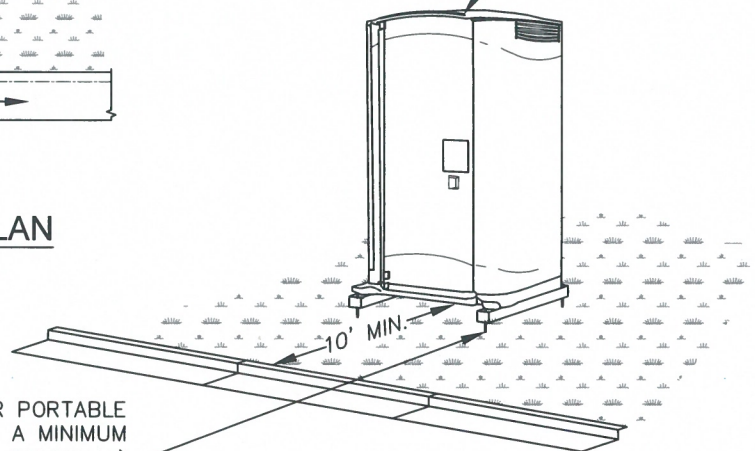
- Portable toilets shall be serviced at the necessary intervals to eliminate the possibility of overflow.

TOP BACK OF CURB, ATTACHED SIDEWALK, OR OTHER IMPERVIOUS AREAS



PORTABLE TOILET PLAN

PORTABLE TOILET (TYPICAL)



ISOMETRIC

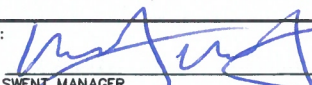
INSTALLATION NOTES

1. PORTABLE TOILETS SHALL BE PLACED A MINIMUM OF 10 FEET BEHIND ALL CURBS, SIDEWALKS, AND OTHER IMPERVIOUS AREAS; 50 FEET FROM STORM INLETS, AND 100 FEET FROM WATERWAYS.
2. PORTABLE TOILETS IN THE RIGHT-OF-WAY ARE REQUIRED TO BE PLACED ON MOBILE TRAILERS AND MUST BE ANCHORED OR WEIGHTED DOWN. PORTABLE TOILETS MAY BE INSTALLED IN ACCORDANCE WITH NOTE #1 IN STAGING AREAS/YARDS.
3. PORTABLE TOILETS SHALL BE SECURELY ANCHORED TO THE GROUND USING U-SHAPED REBAR STAKES, OR OTHER EFFECTIVE ANCHORING.
4. ANCHORING SHALL BE POSITIONED ON AT LEAST TWO OPPOSING (DIAGONAL) CORNERS.
5. TOILET CONTAINMENT PANS MAY BE USED IN PLACE OF A TRAILER AT THE GEC INSPECTOR'S DISCRETION. TOILET CONTAINMENT PANS MUST BE ANCHORED IN PLACE AND MUST NOT BE USED WITHIN THE CITY R.O.W.



MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. PORTABLE TOILETS SHALL BE SERVICED AT THE NECESSARY INTERVALS TO ELIMINATE THE POSSIBILITY OF OVERFLOW.
3. WHEN THE PORTABLE TOILETS ARE REMOVED, ANY DISTURBED AREAS ASSOCIATED WITH THE INSTALLATION, MAINTENANCE, AND/OR REMOVAL OF THE TOILETS MUST BE PERMANENTLY STABILIZED.

			PORTABLE TOILET	
			APPROVED:  SWENT MANAGER	
ISSUED:	2/19/19	REVISED:	8/19/2020	DRAWING NO.
				900-PTM

ROCK SOCK

RS



1.0 DESCRIPTION

- A rock sock consists of gravel that has been wrapped by wire mesh or a geotextile to form an elongated cylindrical filter.

2.0 PURPOSE

- Used to slow down the velocity of runoff to filter runoff and to promote sedimentation.
- Rock socks are typically used as either perimeter control or as a part of inlet protection.

3.0 IMPLEMENTATION

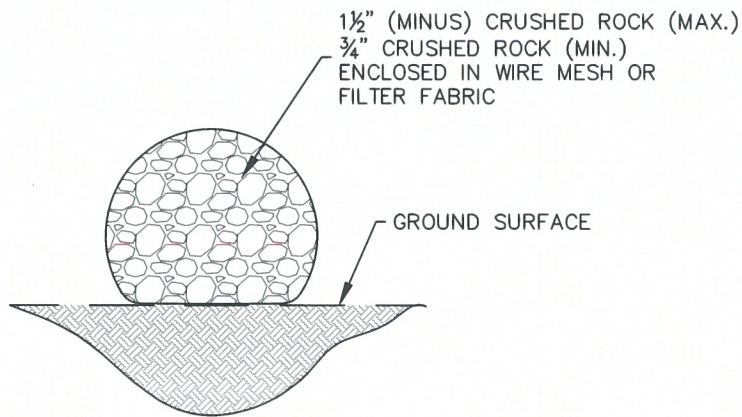
- Rock socks do not require trenching or staking, and are able to be placed on hard surfaces where trenching or staking would be impossible.
- The maximum tributary drainage area per 100 liner feet of rock socks is 1/4 acre.
- When placed in a gutter adjacent to a curb, rock socks should protrude no more than two feet from the curb in order for traffic to pass safely.
- Proprietary rock socks can be used in place of wire mesh rock socks.

4.0 TIMING

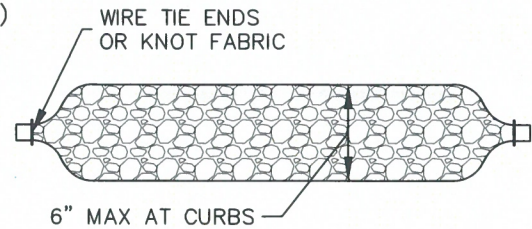
- Install prior to land disturbing activities, or immediately after inlet installation.
- Remove and properly dispose of inlet protection after the contributing drainage area has been permanently stabilized.

5.0 MAINTENANCE

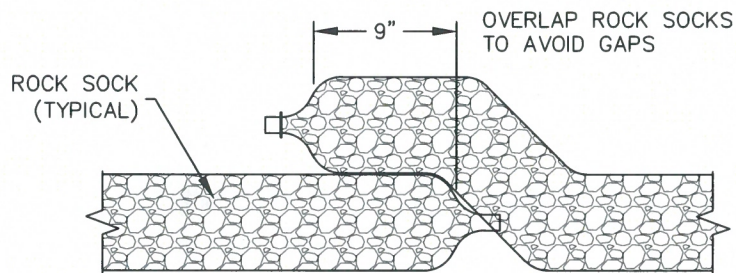
- Remove and properly dispose of sediment when it has accumulated to 1/2 of the height of the rock sock.
- Inspect for and replace damaged or displaced rock socks.



ROCK SOCK SECTION



ROCK SOCK PLAN



ROCK SOCK OVERLAP

GRADATION TABLE

	MASS PERCENT PASSING SQUARE MESH SIEVES
	No. 4
2"	100
1 1/2"	90-100
1"	20-55
3/4"	0-15
3/8"	0-5

MATCHES SPECIFICATIONS FOR
No. 4 COARSE AGGREGATE FOR
CONCRETE PER AASHTO M-43.
ALL ROCK SHALL BE FRACTURED
FACE, ALL SIDES

INSTALLATION NOTES

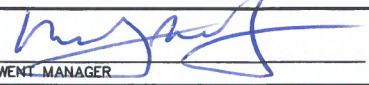
1. CRUSHED ROCK SHALL BE BETWEEN MAX. 1 1/2" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET AND MIN. 3/4" CRUSHED ROCK.
2. WIRE MESH SHALL HAVE OPENINGS SMALLER THAN THE SMALLEST SIZE ROCK.
3. WIRE MESH SHALL BE SECURED USING 'HOG RINGS' OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED OR DAMAGED BEYOND REPAIR.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN THE DEPTH REACHES 1/2 OF THE HEIGHT OF THE ROCK SOCK.
4. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL DISTURBED AREA IS STABILIZED.
5. PERMANENTLY STABILIZE AREA AFTER ROCK SOCKS HAVE BEEN REMOVED.



ROCK SOCK

APPROVED: 		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-RS

SEDIMENT CONTROL LOG

SCL



1.0 DESCRIPTION

- A sediment control log is a temporary sediment barrier consisting of a linear roll of natural materials such as straw, compost, excelsior or coconut fiber.

2.0 PURPOSE

- Used to intercept sheet flow prior to leaving a construction site.
- May be used around the perimeter of a construction site.
- Placed on long slopes to slow down flows.

3.0 IMPLEMENTATION

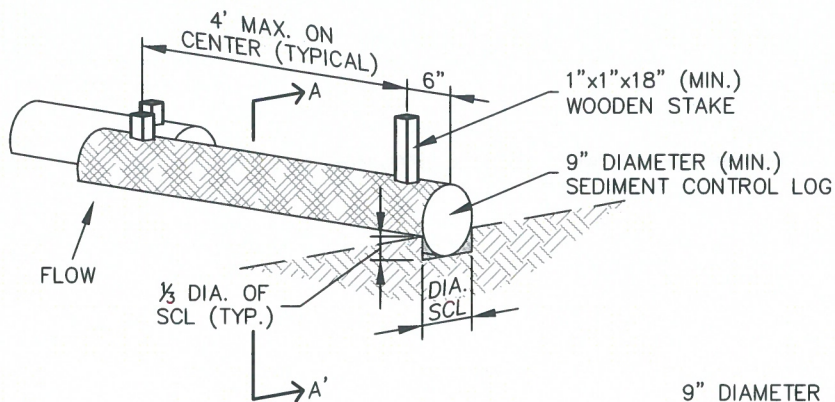
- Install sediment control logs to intercept sheet flow runoff from disturbed areas.
- Install sediment control logs along the contour of slopes or in a manner to avoid creating concentrated flow.
- Place sediment control logs against sidewalk or back of curb when adjacent to these features.
- The maximum tributary drainage area per 100 liner feet of sediment control logs is 1/4 acre.
- Sediment control logs shall consist of straw, compost, excelsior or coconut fiber, and shall be free from any noxious weed seeds or defects.

4.0 TIMING

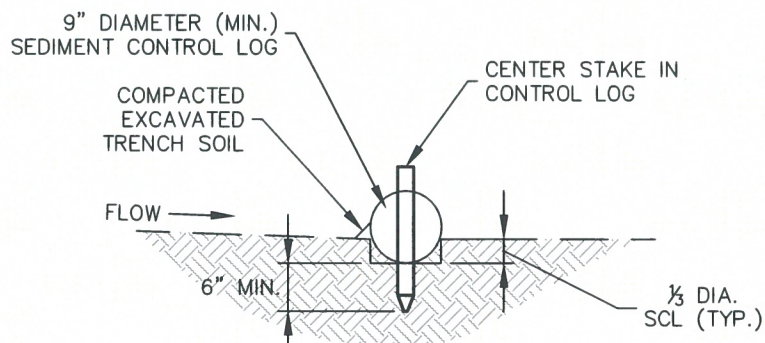
- Install prior to land disturbing activities.
- Remove sediment control logs after the upstream area has been permanently stabilized.

5.0 MAINTENANCE

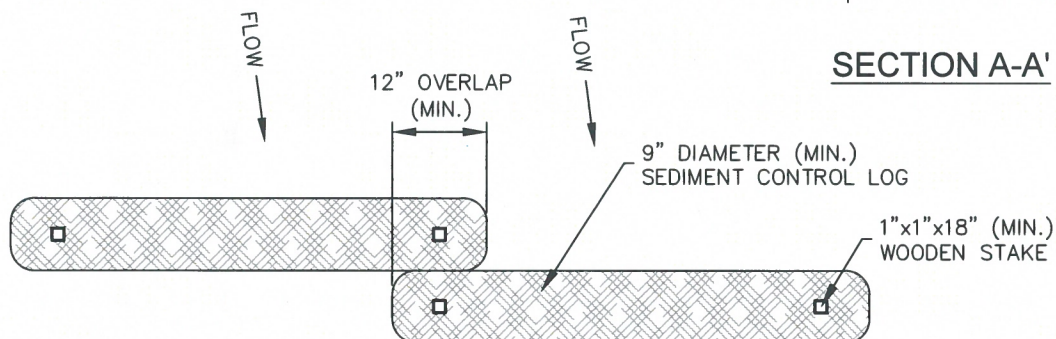
- Remove and properly dispose of sediment when it has accumulated to 1/2 of the height of the exposed sediment control log.
- Inspect for and repair or replace damaged sediment control logs.



SEDIMENT CONTROL LOG



SECTION A-A'



SEDIMENT CONTROL LOG JOINTS

INSTALLATION NOTES

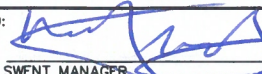
1. ALL SEDIMENT CONTROL LOGS MUST BE EMBEDDED TO $\frac{1}{3}$ OF THE HEIGHT OF THE LOG
2. LARGER DIAMETER SEDIMENT CONTROL LOGS NEED TO BE EMBEDDED DEEPER.
3. PLACE SEDIMENT CONTROL LOG AGAINST SIDEWALK OR BACK OF CURB WHEN ADJACENT TO THESE FEATURES.
4. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE FROM ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.
5. IF USING AS SLOPE PROTECTION, INSTALL SEDIMENT CONTROL LOGS ALONG THE CONTOUR.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES $\frac{1}{2}$ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.
3. PERMANENTLY STABILIZE AREA AFTER SEDIMENT CONTROL LOGS HAVE BEEN REMOVED.



SEDIMENT CONTROL LOGS

APPROVED: 		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-SCL

SILT FENCE

SF



1.0 DESCRIPTION

- Silt fence is a temporary sediment barrier consisting of woven geotextile fabric attached to supporting posts and trenched into the soil.

2.0 PURPOSE

- Used to intercept sheet flow prior to leaving a construction site.
- May be used around the perimeter of a construction site.

3.0 IMPLEMENTATION

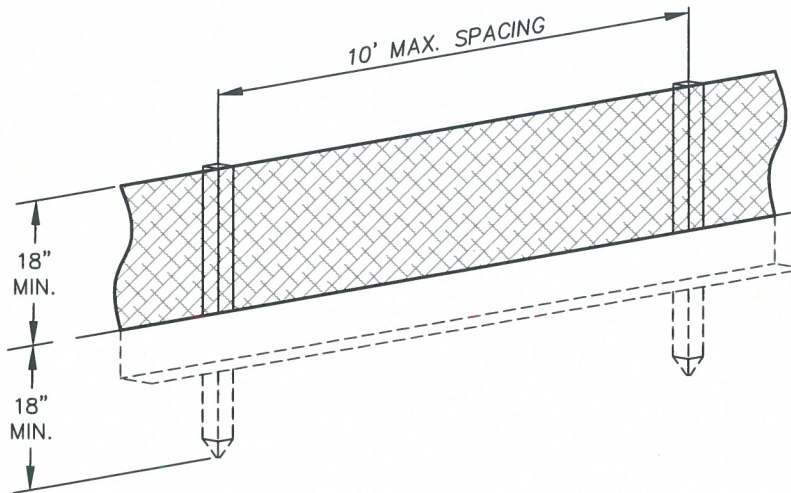
- Install silt fence to intercept sheet flow runoff from disturbed areas.
- Silt fence is not designed to be used as a filter fabric.
- Do not install silt fence across streams, channels, swales, ditches, or other drainageways.
- Install silt fence along the contour of slopes or in a manner to avoid creating concentrated flow (i.e. "J-hook" installation).
- The maximum tributary drainage area per 100 liner feet of silt fence is 1/4 acre.
- Properly installed silt fence should not be easily pulled out by hand and there should be no gaps between the ground and fabric.

4.0 TIMING

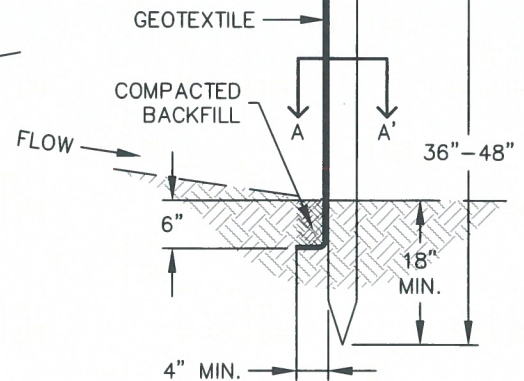
- Install prior to land disturbing activities.
- Remove silt fence after the upstream area has been permanently stabilized.

5.0 MAINTENANCE

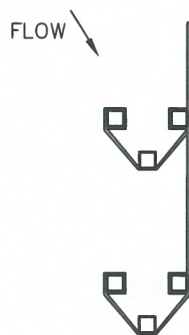
- Remove and properly dispose of sediment when it has accumulated to 1/2 of the height of the exposed silt fence.
- Inspect for and repair or replace damaged silt fence.



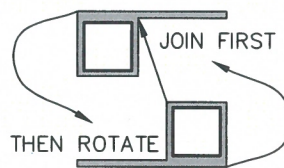
1½"x1½" (RECOMMENDED)
WOODEN FENCE POST
WITH 10' MAX. SPACING



SILT FENCE



J-HOOK INSTALLATION



SECTION A-A'

INSTALLATION NOTES

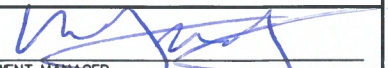
1. SILT FENCE MUST BE PLACED ON A FLAT SURFACE 2'-5' AWAY FROM TOE OF THE SLOPE TO ALLOW FOR PONDING AND DEPOSITION.
2. COMPACT THE TRENCH USING A JUMPING JACK OR WHEEL ROLLING TO THE POINT THAT THE FENCE RESISTS BEING PULLED OUT OF THE GROUND BY HAND.
3. SILT FENCE SHALL BE TAUT WITH NO SAGS AFTER IT HAS BEEN ANCHORED.
4. FABRIC SHALL BE ATTACHED TO POSTS WITH 1" HEAVY DUTY STAPLES OR 1" NAILS. THESE SHOULD BE PLACED VERTICALLY DOWN THE POST, 3" APART.
5. THE PREFERRED INSTALLATION METHOD USES A TRENCHER OR SILT FENCE INSTALLATION DEVICE.
6. INSTALL SILT FENCE ALONG THE CONTOUR OF THE SLOPES OR IN A MANNER TO AVOID CREATING CONCENTRATED FLOW (SUCH AS A "J-HOOK" INSTALLATION).

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ OF THE DESIGN HEIGHT OF THE SILT FENCE.
3. SILT FENCE MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AFTER SILT FENCE IS REMOVED.



SILT FENCE

APPROVED: 		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-SF

SEEDING AND MULCHING

SM



1.0 DESCRIPTION

- The preparation of soil, application of much, and application of seed to disturbed areas.

2.0 PURPOSE

- Used to control runoff and erosion on disturbed areas by establishing vegetative cover.
- Reduces erosion and sediment loss.
- Provides permanent stabilization in disturbed areas.

3.0 IMPLEMENTATION

- All soil testing, soil amendment and fertilizer documentation, and seed load and bag tickets must be added to the CSWMP.
- Properly prepare soil prior to seeding and mulching.
- Apply seed mixes as specified in the City of Colorado Springs Stormwater Construction Manual. Alternative seed mixes are acceptable if included in an approved Landscaping Plan.
- Mulch seeded areas using hay or straw mulch, hydraulic mulching, or install erosion control blanket.

4.0 TIMING

- Seed and mulch disturbed areas after final grading.
- Seeding and mulching may also be used as a temporary erosion control measure during construction.

5.0 MAINTENANCE

- Repair and reseed bare areas as necessary.
- Restrict vehicle access to seeded areas.

SEEDING & MULCHING

ALL SOIL TESTING, SOILS AMENDMENT AND FERTILIZER DOCUMENTATION, AND SEED LOAD AND BAG TICKETS MUST BE ADDED TO THE CSWMP.

SOIL PREPARATION

1. IN AREAS TO BE SEEDED, THE UPPER 6 INCHES OF THE SOIL MUST NOT BE HEAVILY COMPACTED, AND SHOULD BE IN FRIABLE CONDITION. LESS THAN 85% STANDARD PROCTOR DENSITY IS ACCEPTABLE. AREAS OF COMPACTION OR GENERAL CONSTRUCTION ACTIVITY MUST BE SCARIFIED TO A DEPTH OF 6 TO 12 INCHES PRIOR TO SPREADING TOPSOIL TO BREAK UP COMPACTED LAYERS AND PROVIDE A BLENDING ZONE BETWEEN DIFFERENT SOIL LAYERS.
2. AREAS TO BE PLANTED SHALL HAVE AT LEAST 4 INCHES OF TOPSOIL SUITABLE TO SUPPORT PLANT GROWTH.
3. THE CITY RECOMMENDS THAT EXISTING AND/OR IMPORTED TOPSOIL BE TESTED TO IDENTIFY SOIL DEFICIENCIES AND ANY SOIL AMENDMENTS NECESSARY TO ADDRESS THESE DEFICIENCIES. SOIL AMENDMENTS AND/OR FERTILIZERS SHOULD BE ADDED TO CORRECT TOPSOIL DEFICIENCIES BASED ON SOIL TESTING RESULTS.
4. TOPSOIL SHALL BE PROTECTED DURING THE CONSTRUCTION PERIOD TO RETAIN ITS STRUCTURE AVOID COMPACTION, AND TO PREVENT EROSION AND CONTAMINATION. STRIPPED TOPSOIL MUST BE STORED IN AN AREA AWAY FROM MACHINERY AND CONSTRUCTION OPERATIONS, AND CARE MUST BE TAKEN TO PROTECT THE TOPSOIL AS A VALUABLE COMMODITY. TOPSOIL MUST NOT BE STRIPPED DURING UNDESIRABLE WORKING CONDITIONS (E.G. DURING WET WEATHER OR WHEN SOILS ARE SATURATED). TOPSOIL SHALL NOT BE STORED IN SWALES OR IN AREAS WITH POOR DRAINAGE.

SEEDING

1. ALLOWABLE SEED MIXES ARE INCLUDED IN THE CITY OF COLORADO SPRINGS STORMWATER CONSTRUCTION MANUAL. ALTERNATIVE SEED MIXES ARE ACCEPTABLE IF INCLUDED IN AN APPROVED LANDSCAPING PLAN.
2. SEED SHOULD BE DRILL-SEEDED WHENEVER POSSIBLE
 - SEED DEPTH MUST BE $\frac{1}{8}$ TO $\frac{1}{2}$ INCHES WHEN DRILL-SEEDED IS USED
3. BROADCAST SEEDING OR HYDRO-SEEDED WITH TACKIFIER MAY BE SUBSTITUTED ON SLOPES STEEPER THAN 3:1 OR ON OTHER AREAS NOT PRACTICAL TO DRILL SEED.
 - SEEDING RATES MUST BE DOUBLED FOR BROADCAST SEEDING OR INCREASED BY 50% IF USING A BRILLION DRILL OR HYDRO-SEEDED
 - BROADCAST SEEDING MUST BE LIGHTLY HAND-RAKED INTO THE SOIL

MULCHING

1. MULCHING SHOULD BE COMPLETED AS SOON AS PRACTICABLE AFTER SEEDING, HOWEVER PLANTED AREAS MUST BE MULCHED NO LATER THAN 14 DAYS AFTER PLANTING.
2. MULCHING REQUIREMENTS INCLUDE:
 - HAY OR STRAW MULCH
 - ONLY CERTIFIED WEED-FREE AND CERTIFIED SEED-FREE MULCH MAY BE USED. MULCH MUST BE APPLIED AT 2 TONS/ACRE AND ADEQUATELY SECURED BY CRIMPING AND/OR TACKIFIER.
 - CRIMPING MUST NOT BE USED ON SLOPES GREATER THAN 3:1 AND MULCH FIBERS MUST BE TUCKED INTO THE SOIL TO A DEPTH OF 3 TO 4 INCHES.
 - TACKIFIER MUST BE USED IN PLACE OF CRIMPING ON SLOPES STEEPER THAN 3:1.
 - HYDRAULIC MULCHING
 - HYDRAULIC MULCHING IS AN OPTION ON STEEP SLOPES OR WHERE ACCESS IS LIMITED.
 - IF HYDRO-SEEDED IS USED, MULCHING MUST BE APPLIED AS A SEPARATE, SECOND OPERATION.
 - WOOD CELLULOSE FIBERS MIXED WITH WATER MUST BE APPLIED AT A RATE OF 2,000 TO 2,500 POUNDS/ACRE, AND TACKIFIER MUST BE APPLIED AT A RATE OF 100 POUNDS/ACRE.
 - EROSION CONTROL BLANKET
 - EROSION CONTROL BLANKET MAY BE USED IN PLACE OF TRADITIONAL MULCHING METHODS.



SEEDING & MULCHING

APPROVED:

SWENT MANAGER

ISSUED:

10/7/19

REVISED:

8/19/2020

DRAWING NO.

900-SM

STOCKPILE PROTECTION

SP



1.0 DESCRIPTION

- Perimeter control placed around stockpiles of soil and other erodible materials.

2.0 PURPOSE

- Used to avoid the migration of sediment and other materials from stockpiles.

3.0 IMPLEMENTATION

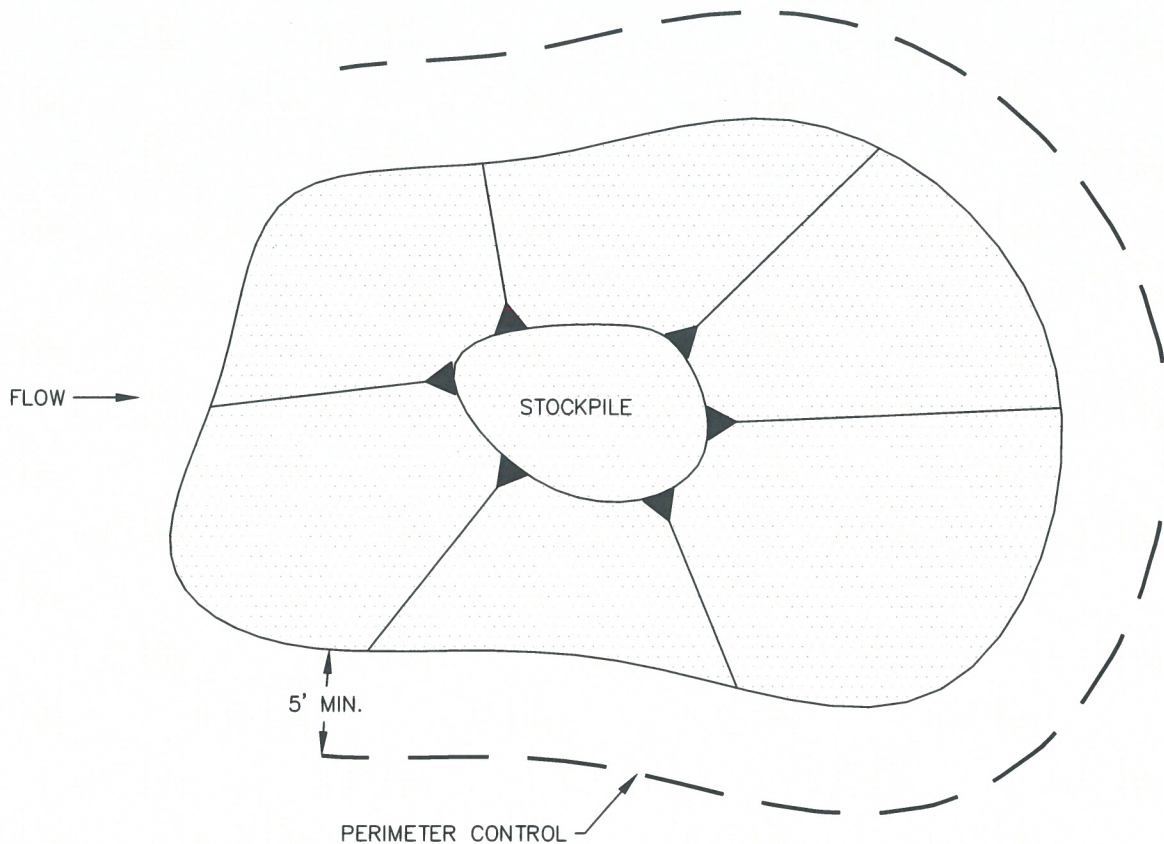
- Install perimeter control around stockpile on downgradient side.
- Stockpile perimeter controls may not be required for stockpiles on the interior portion of a construction site where other downgradient controls including perimeter control are in place.

4.0 TIMING

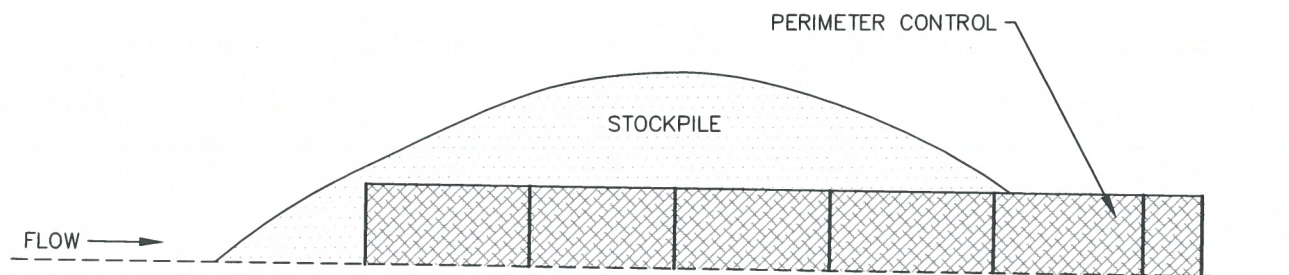
- Install immediately after stockpile has formed or limits are known, whichever occurs first.
- Remove stockpile protection after the stockpile has been removed.

5.0 MAINTENANCE

- Remove and properly dispose of sediment according to the perimeter control detail.
- If perimeter controls must be moved to access stockpile, replace perimeter controls by the end of the work day.
- Inspect for and repair and/or replace perimeter controls as needed to maintain functionality.



STOCKPILE PROTECTION PLAN



STOCKPILE PROTECTION ELEVATION

INSTALLATION NOTES

1. INSTALL PERIMETER CONTROL AROUND STOCKPILE ON DOWNGRAIDENT SIDE. PERIMETER CONTROL MUST BE SUITABLE TO SITE CONDITIONS AND INSTALLED ACCORDING TO THE RELEVANT DETAIL.
2. FOR STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRAIDENT CONTROLS INCLUDING PERIMETER CONTROL ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. IF PERIMETER CONTROLS MUST BE MOVED TO ACCESS STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORK DAY.
3. ACCUMULATED SEDIMENT MUST BE REMOVED ACCORDING TO PERIMETER CONTROL DETAIL.



STOCKPILE PROTECTION

APPROVED:

SWENT MANAGER

ISSUED:

10/7/19

REVISED:

8/19/2020

DRAWING NO.

900-SP

SURFACE ROUGHENING

SR



1.0 DESCRIPTION

- Surface roughening is a practice where the soil surface is roughened by the creation of grooves and depressions that run parallel to the contour of the land.

2.0 PURPOSE

- Used to create variations in the soil surface that slow down the velocity of runoff, increase infiltration, reduce erosion, and trap soil.
- May be used to help establish vegetative cover by reducing runoff velocity and giving seed an opportunity to take hold.

3.0 IMPLEMENTATION

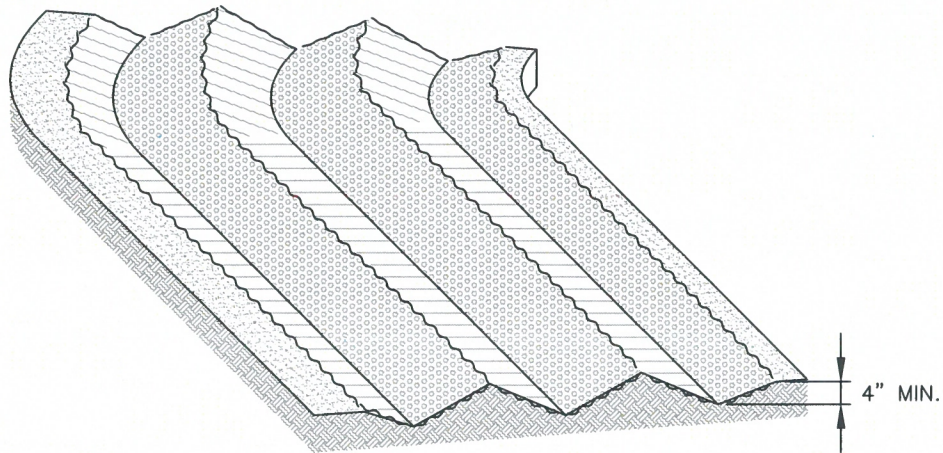
- Roughen soil in areas flatter than 3:1.
- Surface roughening may be completed by furrowing, scarifying, ripping, or disking soil.
- Grooves must be installed along contours to avoid concentrating flow.
- Do not use in areas with extremely sandy or rocky soils.

4.0 TIMING

- Install after overlot grading activities when area is in an interim condition or at final grade.
- Remove prior to permanent stabilization during soil preparation.

5.0 MAINTENANCE

- Inspect roughened areas for signs of erosion. Repeat surface roughening as needed.
- Do not allow vehicles to drive over surface roughened areas.



SURFACE ROUGHENING

INSTALLATION NOTES

1. SURFACE ROUGHENING MAY BE USED IN AREAS FLATTER THAN 3:1. INSTALL FURROWS ALONG CONTOUR TO INTERCEPT SHEET FLOW.
2. SURFACE ROUGHENING MAY BE ACCOMPLISHED BY FURROWING, SCARIFYING, RIPPING OR DISKING THE SOIL.
3. FURROWS MUST BE A MINIMUM OF 4" IN DEPTH.
4. SURFACE ROUGHENING SHALL NOT BE USED ON EXTREMELY SANDY OR ROCKY SOILS.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. VEHICLES AND EQUIPMENT SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SURFACE ROUGHENED.

SR



SURFACE ROUGHENING

APPROVED:

SWENT MANAGER

ISSUED:
10/7/19

REVISED:
8/19/2020

DRAWING NO.
900-SR

SLOPE TRACKING

ST



1.0 DESCRIPTION

- Slope tracking is a practice where construction equipment is used to create grooves and depressions that run parallel to the contour of the land on slopes.

2.0 PURPOSE

- Used to create variations in the soil surface that slow down the velocity of runoff, increase infiltration, reduce erosion, and trap soil.

3.0 IMPLEMENTATION

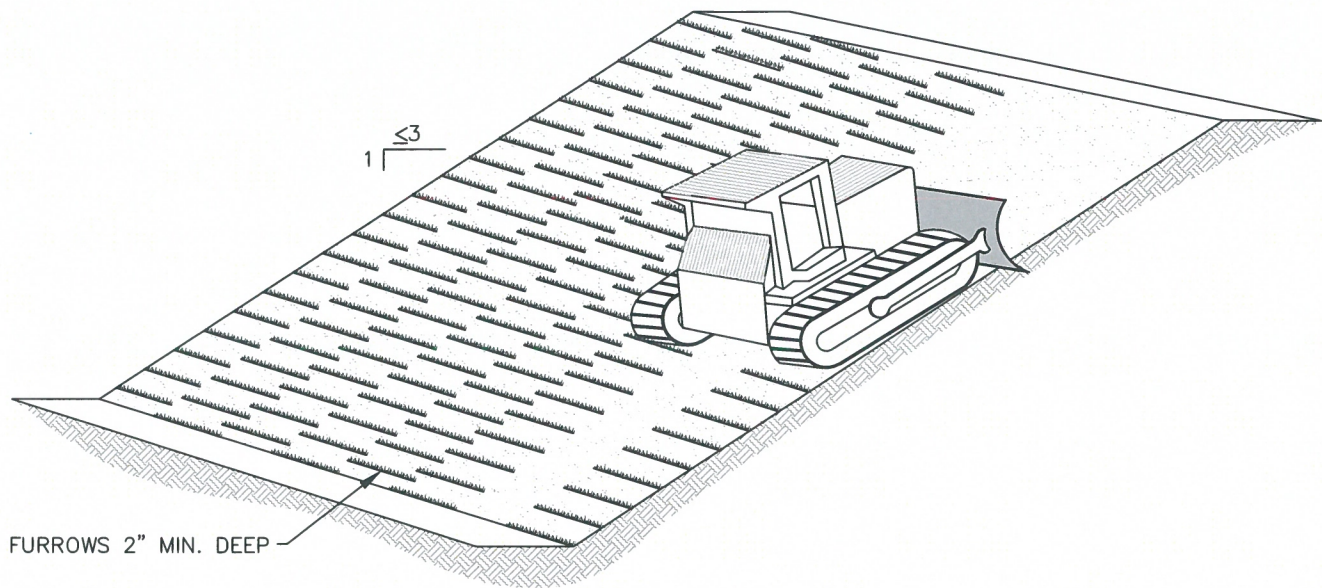
- Use slope tracking on slopes 3:1 or steeper.
- Grooves must be installed along contours to avoid concentrating flow.
- Do not use in areas with extremely sandy or rocky soils.

4.0 TIMING

- Install after land disturbing activities when area is in an interim condition or at final grade.
- Remove prior to permanent stabilization during soil preparation.

5.0 MAINTENANCE

- Inspect areas with tracking for signs of erosion. Repeat slope tracking as needed.
- Do not allow vehicles to drive over tracked areas.



SLOPE TRACKING

INSTALLATION NOTES

1. SLOPE TRACKING MAY BE USED ON SLOPES 3:1 OR STEEPER.
2. TRACKING GROOVES SHALL BE PERPENDICULAR TO THE SLOPE.
3. SLOPE TRACKING SHALL NOT BE USED ON EXTREMELY SANDY OR ROCKY SOILS.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. VEHICLES AND EQUIPMENT SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SLOPE TRACKED.

ST



SLOPE TRACKING

APPROVED:

SWENT MANAGER

ISSUED:

10/7/19

REVISED:

8/19/2020

DRAWING NO.

900-ST

TEMPORARY COMPACTED BERM

TCB



1.0 DESCRIPTION

- A temporary compacted berm is a compacted ridge that slows and diverts stormwater from disturbed areas.

2.0 PURPOSE

- Used to intercept sheet flow prior to leaving a construction site.
- May be used around the perimeter of a construction site.
- Placed on long slopes to slow down flows.

3.0 IMPLEMENTATION

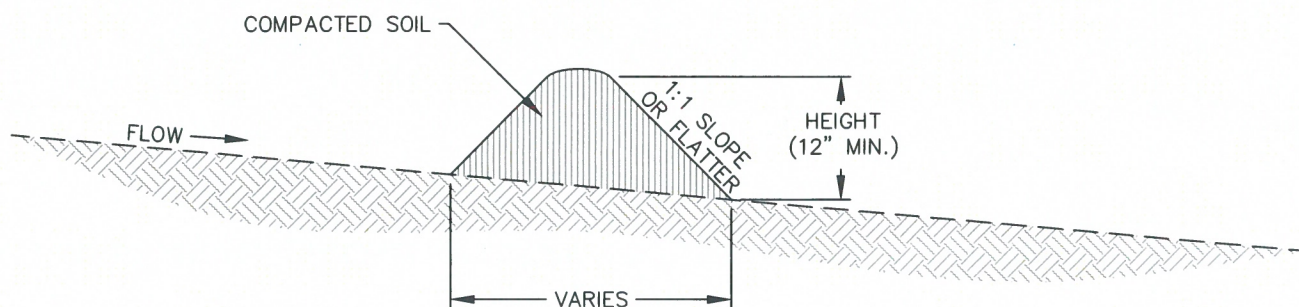
- Compacted berms must be a minimum height of one foot.
- Adequately compact berms. Not all soils are suitable for compacted berms. Soils may need to be adequately watered down to facilitate compaction.
- Install compacted berms along the contour of slopes or in a manner to avoid creating concentrated flow.
- The maximum tributary drainage area per 100 linear feet of an installed compacted berm is 1/4 acre.

4.0 TIMING

- Install prior to land disturbing activities.
- Remove compacted berms after the upstream area has been permanently stabilized. Permanently stabilize area after compacted berms have been removed.

5.0 MAINTENANCE

- Remove and properly dispose of sediment when it has accumulated to 1/2 of the height of the compacted berm.
- Inspect for and repair damaged compacted berms.
- Do not allow vehicles to drive over berms.



TEMPORARY COMPACTED BERM

INSTALLATION NOTES


1. COMPACTED BERM MUST BE A MINIMUM HEIGHT OF ONE FOOT. BASE WIDTH IS DETERMINED BY HEIGHT.
2. COMPACTED BERMS MUST BE ADEQUATELY COMPACTED. NOT ALL SOILS ARE SUITABLE FOR COMPACTED BERMS.
3. INSTALL COMPACTED BERMS ALONG CONTOUR; DO NOT INSTALL PERPENDICULAR TO SLOPE.
4. THE MAXIMUM TRIBUTARY DRAINAGE AREA PER 100 LINEAR FEET OF COMPACTED BERMS SHALL BE $\frac{1}{4}$ ACRE.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES $\frac{1}{2}$ OF THE DESIGN DEPTH OF THE BERM.



TEMPORARY COMPACTED BERM

APPROVED: 		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-TCB

TEMPORARY SEDIMENT BASIN

TSB



1.0 DESCRIPTION

- Temporary sediment basins are small impoundments of water with a small outlet structure built on a construction site.

2.0 PURPOSE

- Used to capture and slowly release runoff prior to discharge from a construction site to allow sediment to settle out.

3.0 IMPLEMENTATION

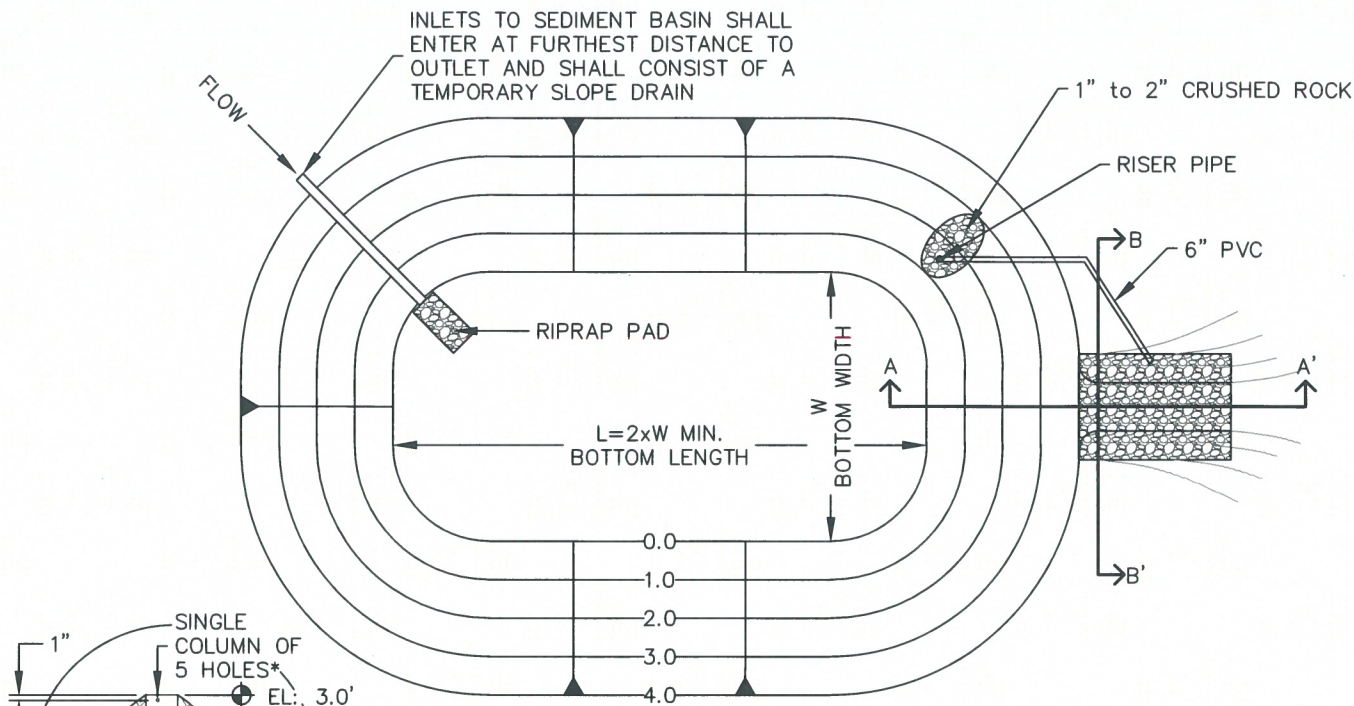
- Temporary sediment basins for drainage areas larger than 15 acres must be individually designed by engineer.
- Erosion and other sediment controls should be implemented upstream of temporary sediment basins.

4.0 TIMING

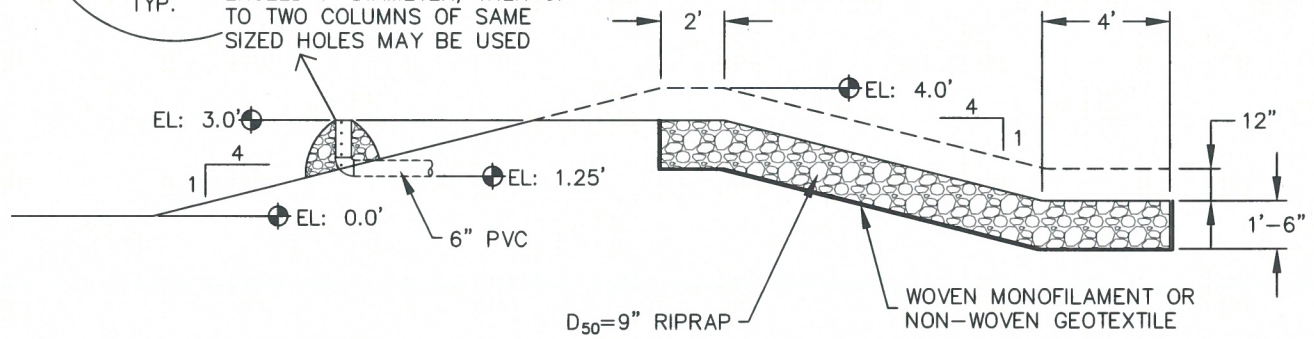
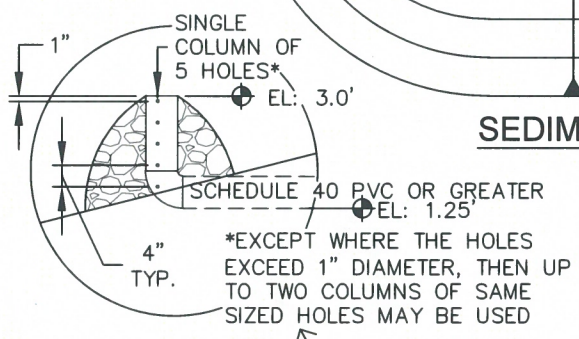
- Install prior to upstream land disturbance.
- Remove temporary sediment basin after upstream area has been stabilized. Permanently stabilize area after basin has been removed.

5.0 MAINTENANCE

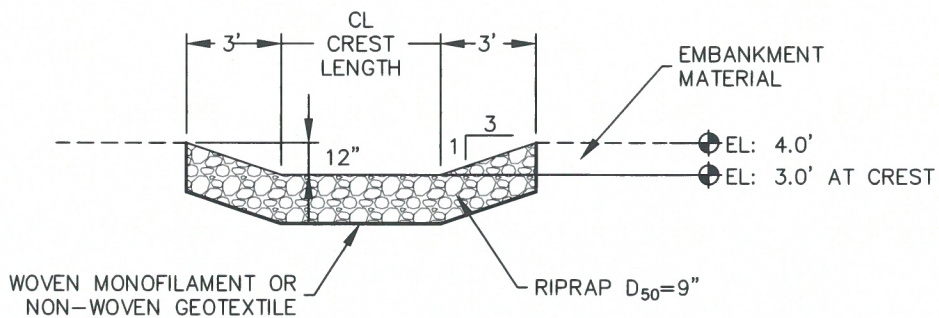
- Remove sediment from basin as needed to maintain the effectiveness of the temporary sediment basin. This is typically when sediment depth reaches one foot.
- Inspect sediment basin embankments for stability and seepage.
- Inspect the inlet and outlet of the basin, repair damage, and remove debris.



SEDIMENT BASIN PLAN



SECTION A-A'



SECTION B-B'



	TEMPORARY SEDIMENT BASIN		
	APPROVED:		
	SWENT MANAGER		
	ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-TSB-1

TABLE SB-1, SIZING INFORMATION FOR
STANDARD SEDIMENT BASIN

UPSTREAM DRAINAGE AREA (ROUNDED TO NEAREST ACRE), (AC)	BASIN BOTTOM WIDTH (W), (FT)	SPILLWAY CREST LENGTH (CL), (FT)	HOLE DIAMETER (HD), (IN)
1	12½"	2	9/32
2	21	3	13/16
3	28	5	½
4	33½	6	9/16
5	38½	8	21/32
6	43	9	23/32
7	47¼	11	25/32
8	51	12	27/32
9	55	13	7/8
10	58¼	15	15/16
11	61	16	31/32
12	64	18	1
13	67½	19	1 1/16
14	70½	21	1 1/8
15	73¼	22	1 3/16

INSTALLATION NOTES

1. FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.
2. EMBANKMENT MATERIAL SHALL CONSIST OF SOIL FREE OF DEBRIS, ORGANIC MATERIAL, AND ROCKS OR CONCRETE GREATER THAN 3 INCHES, AND SHALL HAVE A MINIMUM OF 15 PERCENT BY WEIGHT PASSING THE No. 200 SIEVE
3. EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D-698.
4. PIPE SCHEDULE 40 OR GREATER SHALL BE USED.
5. THE DETAILS SHOWN ON THESE SHEETS PERTAIN TO STANDARD SEDIMENT BASIN(S) FOR DRAINAGE AREAS LESS THAN 15 ACRES. SEE CONSTRUCTION DRAWINGS FOR EMBANKMENT, STORAGE VOLUME, SPILLWAY, OUTLET, AND OUTLET PROTECTION DETAILS FOR ANY SEDIMENT BASIN(S) THAT HAVE BEEN INDIVIDUALLY DESIGNED FOR DRAINAGE AREAS LARGER THAN 15 ACRES. DESIGN CALCULATIONS MUST BE APPROVED PRIOR TO IMPLEMENTATION.

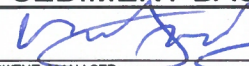
MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. SEDIMENT ACCUMULATED IN BASIN SHALL BE REMOVED AS NEEDED TO MAINTAIN CONTROL MEASURE EFFECTIVENESS, TYPICALLY WHEN SEDIMENT DEPTH REACHES ONE FOOT (I.E. TWO FEET BELOW SPILLWAY CREST).
3. SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED.
4. PERMANENTLY STABILIZE AREA AFTER SEDIMENT BASIN REMOVAL.

TSB



TEMPORARY SEDIMENT BASIN

APPROVED: 		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-TSB-2

TEMPORARY SLOPE DRAIN

TSD



1.0 DESCRIPTION

- A temporary slope drain is a flexible conduit for stormwater that extends down the length of a disturbed slope to divert stormwater and serve as a temporary outlet.

2.0 PURPOSE

- Used to convey runoff during construction without causing erosion on or at the bottom of a slope.

3.0 IMPLEMENTATION

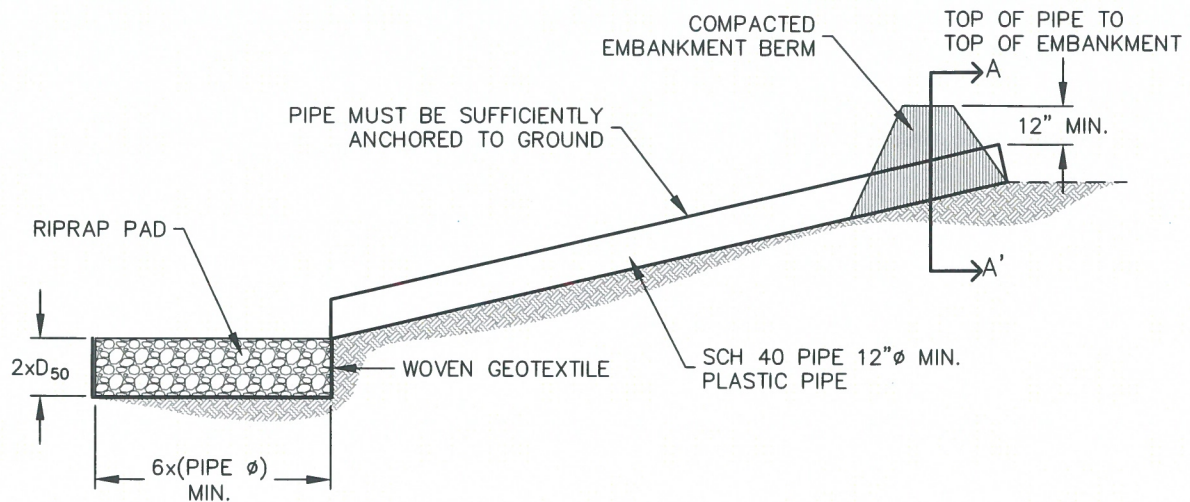
- Direct runoff into flexible pipe using a temporary compacted embankment berm.
- Anchor pipe to slope.
- Install riprap pad at pipe outlet.

4.0 TIMING

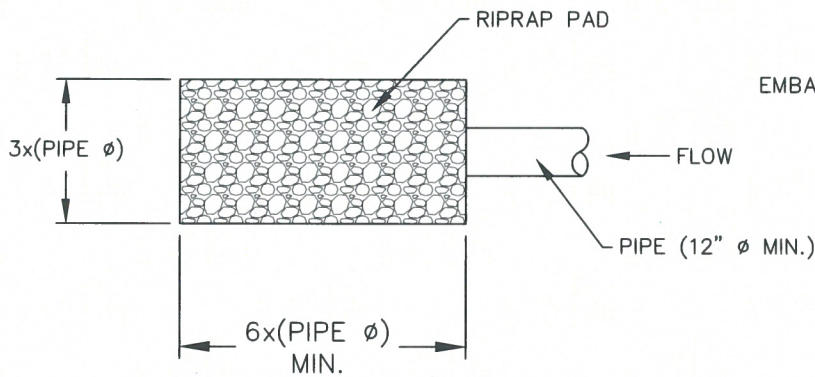
- Install prior to upstream land disturbing activities.
- Remove temporary slope drain prior to the end of construction after the contributing drainage area has been permanently stabilized.

5.0 MAINTENANCE

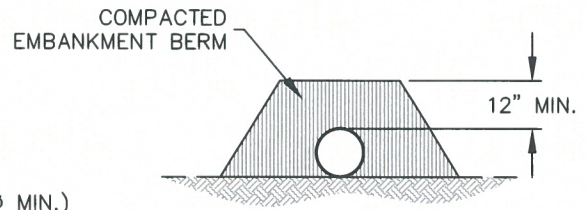
- Inspect for erosion and accumulated debris at the inlet and outlet.
- Breaches in pipes should be repaired as soon as feasibly possible.



TEMPORARY SLOPE DRAIN



RIPRAP PAD PLAN



SECTION A-A'

INSTALLATION NOTES

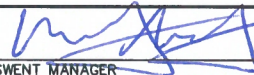
1. THE LISTED DIMENSIONS ARE CONSIDERED A MINIMUM; LARGER DRAINS CAN BE IMPLEMENTED BY THE CONTRACTOR.
2. DETAILS SHOW MINIMUM COVER; INCREASE COVER AS NECESSARY.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. INSPECT INLETS AND OUTLETS AFTER STORMS TO PREVENT EXCESS CLOGGING. BREACHES IN PIPES SHOULD BE REPAIRED AS SOON AS FEASIBLY POSSIBLE.
3. INSPECT RIPRAP PAD AT OUTLET FOR SIGNS OF EROSION. IF SIGNS OF EROSION EXIST, ADDITIONAL ARMORING MAY BE INSTALLED.
4. TEMPORARY SLOPE DRAINS SHOULD REMAIN UNTIL THEY ARE NOT NEEDED, BUT SHOULD BE REMOVED BEFORE THE END OF CONSTRUCTION.
5. PERMANENTLY STABILIZE AREA AFTER TEMPORARY SLOPE DRAINS ARE REMOVED.



TEMPORARY SLOPE DRAIN

APPROVED: 		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-TSD

VEHICLE TRACKING CONTROL

VTC



1.0 DESCRIPTION

- Vehicle tracking control consists of a pad of coarse stone aggregate placed on a geotextile filter fabric.

2.0 PURPOSE

- Used to reduce the tracking of sediment onto roadways by construction vehicles.
- As vehicles drive over the VTC device, mud and sediment is removed from the tires.

3.0 IMPLEMENTATION

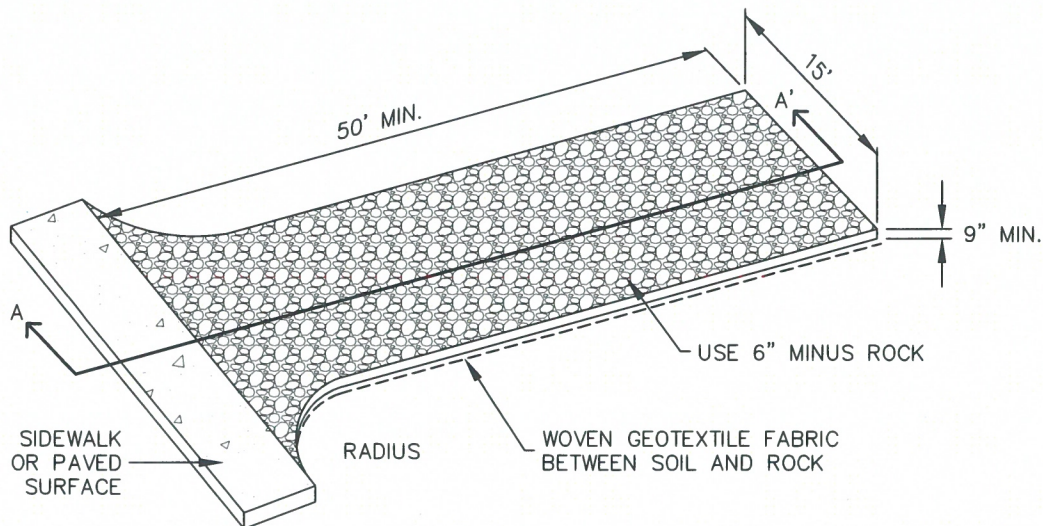
- Locate at construction entrance/exit.
- Organize site to ensure that all vehicles use the vehicle tracking control device.
- Where possible, grade VTC device to drain to construction site rather than to street.
- Proprietary VTC devices may be used if approved as an alternative Construction Control Measure.

4.0 TIMING

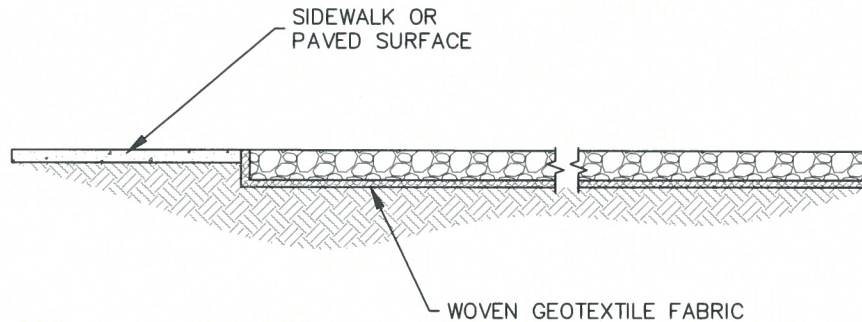
- Install prior to land disturbing activities.
- Remove when the potential for sediment migration onto adjacent roadways no longer exists (typically after site has been stabilized). Permanently stabilized area after vehicle tracking control is removed.

5.0 MAINTENANCE

- Roughen, replace, and/or add rock as needed to maintain a consistent depth and to prevent sediment tracking onto adjacent street.
- Sediment tracked onto the adjacent road shall be removed daily, by sweeping or shoveling, and never washed down storm drains.



AGGREGATE VEHICLE TRACKING CONTROL



SECTION A-A'

INSTALLATION NOTES

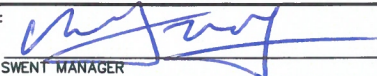
1. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHOULD BE LOCATED AT ALL POINTS WHERE VEHICLES EXIT THE CONSTRUCTION SITE TO ADJACENT ROADWAY.
2. STABILIZED CONSTRUCTION ENTRANCE/EXITS SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
3. RADIUS MUST BE ADEQUATE FOR INTENDED CONSTRUCTION VEHICLE TURNING.
4. ROCK SHOULD CONSIST OF 6" MINUS ROCK.
5. INSTALL CONSTRUCTION FENCE ON BOTH SIDES OF VEHICLE TRACKING CONTROL PAD WHEN NEEDED OR REQUIRED BY INSPECTOR.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. SEDIMENT TRACKED ONTO THE ADJACENT ROAD SHALL BE REMOVED DAILY, BY SWEEPING OR SHOVELING, AND NEVER WASHED DOWN STORM DRAINS.
3. ROUGHEN, REPLACE AND/OR ADD ROCK AS NEEDED TO MAINTAIN CONSISTENT DEPTH AND TO PREVENT SEDIMENT TRACKING ONTO ADJACENT STREET.
4. PERMANENTLY STABILIZE AREA AFTER VEHICLE TRACKING CONTROL IS REMOVED.



VEHICLE TRACKING CONTROL

APPROVED: 		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-VTC